Report No. 1354a-KO

Korea: Appraisal of Second Port Project

March 25, 1977

East Asia and Pacific Department
Transportation Division

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CURRENT EQUIVALENT

Current Unit	=	Won
US$1	=	Won 485
Won 100	=	US$0.21
Won 1,000,000	=	US$2,062

WEIGHTS AND MEASURES

1 meter (m)	=	3.28 feet (ft)
1 square meter (m^2)	=	10.76 square feet (ft^2)
1 cubic meter (m^3)	=	35.29 cubic feet (ft^3)
1 kilometer (km)	=	0.62 miles (mi)
1 square kilometer (km^2)	=	0.39 square miles (sq mi)
1 hectare (ha)	=	2.47 acres (ac)
1 metric ton (m ton)	=	1,000 kilograms (kg) or 2,240 pounds (lb)
1 revenue ton	=	on average approximately 600 kg or 1322.4 lb

ABBREVIATIONS AND ACRONYMS

ADB	-	Asian Development Bank
BDMPA	-	Busan District Maritime and Port Authority
dwt	-	deadweight tons
EPB	-	Economic Planning Board
GNP	-	Gross National Product
GRT	-	Gross Registered Tonnage
KAL	-	Korean Airlines
KIST	-	Korean Institute of Science and Technology
KMPA	-	Korea Maritime and Port Authority
KNR	-	Korean National Railroad
KPDS	-	Korea Port Development Study
LWOST	-	Low Water Ordinary Spring Tides
MOC	-	Ministry of Construction
MOF	-	Ministry of Finance
MOT	-	Ministry of Transportation
TCMC	-	Transport Coordination Minister's Conference
TCO	-	Transport Coordination Office
TOC	-	terminal operating company
TPO	-	Transport Planning Office

FISCAL YEAR

January 1 - December 31

N.B. All water depths given in this report are below LWOST.

KOREA

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This report has been prepared by Messrs. F. Gyi (engineer), R.H. Roberts (economist), and K.C. Rodley (financial analyst).

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SUMMARY AND CONCLUSIONS

i. Freight traffic through Korean ports has increased from about 11 million tons in 1965 to about 70 million tons in 1975. This over six fold increase resulted in serious port capacity problems, particularly at Busan, the largest port, which handles 20% of the country's external trade and is chronically congested. The large and fast-growing external trade of south-east Korea moves largely through the port of Busan, which also handles a substantial volume of containerized goods moving to and from the Seoul area.

ii. The Government has requested the Bank to finance a project for the further development of Busan port, consisting of a 700 m extension of the container wharf being financed under Loan 917-KO. The proposed project, which will meet traffic requirements until about 1985, is based on the Korea Port Development Study-Phase II (KPDS-II) financed under Loan 917-KO and undertaken by consultants (Trans Asia Engineering and King & Gavaris in association with Arthur D. Little - US). The proposed project would also provide container handling equipment, including four container cranes, together with related buildings and services and two tugs. Rehabilitation of two existing piers and two wharves would also be included. Substantial technical assistance would be provided, covering cargo handling operations, maintenance of facilities and container handling equipment, port planning and accounting.

iii. The Korea Maritime and Port Authority (KMPA) was set up in March 1976, in accordance with the requirements of Loan 917-KO 1/, and key appointments were made soon after. While KMPA is operating satisfactorily and the organizational structure is generally acceptable, the project proposes a strengthening of its staffing, particularly in the accounting field, and a reorganization of cargo handling operations to reduce the number of cargo handling companies to one at each pier or specialized bulk-handling facility, with KMPA staff assuming a more active supervisory responsibility for cargo operations; improved procedures will be adopted to facilitate cargo movements within the Customs area. The financial autonomy with which the Government was required, under Loan 917-KO, to vest KMPA, has not yet been achieved because of the constraints of the Law under which KMPA was established. The Government has agreed to amend the Law so as materially to increase KMPA's financial autonomy.

1/ The Loan Agreement required the Government to set up the Korea Port Authority; however, the Government decided, with the Bank's agreement, to include in the Authority's functions supervision of maritime affairs. The Authority's title was changed accordingly to the Korea Maritime and Port Authority.

iv. The proposed project is estimated to cost US$112 million, and the proposed loan would cover US$67 million equivalent of the foreign exchange component. The Government would finance the remaining US$3 million of the foreign exchange component, and local currency costs, estimated to be about US$42 million.

v. The project would be executed by KMPA, with consultant assistance, under three civil engineering contracts and two procurement contracts, which would be awarded on the basis of international competitive bidding. A 15% preference for local manufacturers would be granted in respect of mechanical equipment and floating craft. Construction could start early in 1978 and would be completed by the end of 1981.

vi. The proposed project would avoid the constraints on economic growth which a shortage of port capacity in Busan port would impose on south east Korea. It would also reduce transport costs by: (a) avoiding ship waiting time; (b) eliminating transfer of about 30% of containers to and from container yards outside the port; and (c) avoiding the need to route Seoul container traffic through Incheon at extra cost. These benefits yield a return of about 17% on the proposed project, which is the least cost way of meeting the forecast traffic growth.

vii. Congestion in city streets surrounding the port is likely to result in steadily increasing transport costs on all goods moving in and out of the port and, ultimately, could limit the port's capacity unless measures are taken to improve the city's road network. The Government will construct, by December 31, 1979, a road from the port area to the Seoul/Busan expressway which will eliminate any congestion affecting traffic moving between the port and the Seoul area, and should help to relieve congestion in the city center. The Government will also undertake a study of city-wide transport and land use which will seek medium-term solutions to the city's congestion and assess their feasibility.

viii. Busan port's present financial position is satisfactory and will remain so, subject to tariff increases, which have been assumed in the financial projections, as follows: (a) overall increases of 15% on July 1, 1978, and 20% on July 1, 1981; (b) imposition, effective in 1978, of a charge to the cargo-handling companies for their use of port assets.

ix. The proposed project provides a suitable basis for a Bank loan of US$67 million equivalent to the Government of Korea for a term of 17 years, including a grace period of 3-1/2 years. KMPA would assume a debt to the Government in the same amount and on similar terms on January 1, 1979, following the necessary legislative changes.

KOREA

APPRAISAL OF SECOND PORT PROJECT

I. INTRODUCTION

1.01 The Government of the Republic of Korea (the Government) has asked the Bank to help in financing a second port project at the port of Busan consisting of a 700 m extension of the container pier being provided under Loan 917-KO, together with rehabilitation of some existing piers and wharves, procurement of container handling equipment and floating craft, and provision of consultant services for detailed engineering and technical assistance. The proposed project would meet anticipated traffic growth at the port through about 1985 in the most economic manner. It forms part of the Government's Fourth Five-Year Development Plan 1977-81, and is based on a study, Korea Port Development Study-Phase II (KPDS-II), prepared by consultants (Trans Asia Engineering and King & Gavaris in association with Arthur D. Little - US) and financed under Loan 917-KO.

1.02 The Bank Group's previous assistance in financing the transport sector has amounted to US$491 million, and includes one previous port project, Loan 917-KO in 1973 (US$80 million); three highway projects, Loan 769-KO in 1971 (US$54.5 million), Loan 956-KO in 1974 (US$47 million) and Loan 1203-KO in 1976 (US$90 million); and five railway projects, Credit 25-KO in 1962 (US$14 million); Credit 110-KO in 1967 (US$10.7 million); Loan 669-KO/Credit 183-KO in 1970 (US$55 million); Loan 863-KO in 1972 (US$40 million); and Loan 1101-KO in 1975 (US$100 million). Performance on these projects has been generally satisfactory. In addition, a further railway project is expected to be appraised in April 1977.

1.03 Construction of the First Port Project is proceeding satisfactorily and it is expected to be completed on schedule in mid-1978. However, following the oil price increases of 1973-74 the project has experienced serious cost overruns. The total project cost is now expected to be US$42 million (35%) higher than estimated at the time of project appraisal, including about US$27 million foreign exchange. The Government signed a Loan Agreement, on March 8, 1976, with the Saudi Fund for Development, which will provide up to US$35 million equivalent towards the foreign exchange cost overrun. As required by the conditions of Loan 917-KO, the Government established, in March 1976, the Korea Maritime and Port Authority (KMPA) and, at the same time, set up port administrative units at all first-class ports, including the project ports. The degree of financial autonomy which was to have been granted to KMPA upon its establishment will be granted by January 1, 1979, following the necessary legislative changes.

1.04 This report is based on the consultants' report, data supplied by the Government and the findings of an appraisal mission composed of Messrs. F. Gyi (engineer), R. Roberts (economist), J. Cuthbertson (consultant, financial analyst), and J. Cracknell (consultant, traffic engineer) which visited Korea in May, 1976.

II. BACKGROUND

A. Economic Setting

2.01 Korea's economy has maintained an average annual real growth of GNP of around 10% p.a. over the past fifteen years, including an impressive annual real increase of 11% over the Third Five-Year Plan period (1972-76). Per capita income which was around US$100 in 1962 has increased to nearly US$700, in current prices, by 1976, or nearly a three-fold increase over the period. During the past three Five-Year Plan periods the growth of the economy accelerated from 9% during the 1963-66 to 10.5% in 1967-71. The performance of the economy over the last three years of the Third Plan was particularly impressive in view of the recent world-wide recession which affected Korea's trade. The sustained high rate of growth over the fifteen-year period has transformed Korea from one of the poorest developing countries to a semi-industrialized, middle-income country with a significant industrial base that provides the main thrust of the economy's high growth performance.

2.02 The most striking feature of Korea's rapid economic growth has been the rapid expansion of exports from less than US$200 million in 1965 to nearly US$8 billion, an annual real expansion of over 33%. Industrial expansion resulted in a structural transformation of the economy as the share of agriculture declined over the 1961-76 period from about 44% to 20%, while the share of manufacturing increased from less than 11% to 35%, with value added in manufacturing growing at 19% annually in real terms. The social overhead sectors have kept up with the manufacturing sector, growing at about 15% per annum. Fixed investment increased from 11% of GNP in 1960 to more than 20% of GNP by the mid 1960's and has since been about 23% to 26% of GNP.

2.03 Over the past year, the Korean economy appeared to have fully recovered from the 1974/75 twin shocks of high import costs and depressed demand for manufactured exports in the major importing countries. GNP grew at 15.2% in 1976 compared with the average rate of 8.5% in the previous two years. While employment levels declined somewhat during the 1974-75 recession, Government holding policies prevented a rapid decline in employment through various financial incentives to enterprises to carry inventory and maintain a high level of production. This enabled Korean exporters to take advantage of the recovery in the export markets that occurred in the latter half of 1975. Inflation has been reduced in the process of high growth. In 1976 wholesale prices were only about 9% higher than their 1975 levels compared with increases of 42% and 26% in 1974 and 1975. The devaluation of the Won and the various price rationalization measures adopted in 1975 enabled domestic prices to adjust to the new international price levels. Other policy measures included a reduction in the rate of increase of money supply and a stricter price monitoring for major commodities. There has also been a sharp reduction in the balance of payments current account deficit from nearly US$2 billion in 1974-75 to less than US$300 million in 1976, and this lays a firm foundation for the Government's efforts to reduce foreign borrowing during the Fourth Five-Year Plan. The plan envisages an annual growth of GNP of 9.2% with exports and imports expanding at 16% and 12%,

respectively, in real terms. The Plan investment is set at Won 18 trillion in 1975 prices or 26.2% of GNP. Total investment allocation for the transport sector is Won 2.78 trillion including about Won 250 billion for Ports. While the Plan's targets are achievable, the resource requirements have been somewhat under-estimated. Additional domestic and foreign resource mobilization efforts will therefore be required if the Plan's target growth rate is to be realized.

B. Transport Sector

Recent Developments

2.04 The transport sector, measured in terms of value added, grew faster than the economy during the past decade and registered an average growth rate of about 16% p.a., compared to just over 10% p.a., for the GNP. The share of transport in the GNP increased to 5.1% in 1974 and over the same period the share of investment devoted to transport grew to 21% of the total capital formation.

2.05 The rapid expansion of transport demand has imposed a severe strain on the transport infrastructure which up to about 1966 had not been modernized, except for some improvements to the railways. The resulting shortage of capacity caused bottlenecks which have required a massive reorientation of the transport development strategy within the last 10 years, but there are still deficiencies particularly in the highway network. Investments for transport and storage represented about 16% of the Third Plan (1972-76) and will be about 15% of the Fourth Plan (1977-81). However, total investments will rise rapidly and the constant value of transport investment will increase by about 50%. The allocation for railways and roads in the Fourth Plan will form 58% of total transport investment. The allocation for ports and shipping will be 36%, compared with 28% in the Third Plan, an increase which reflects Korea's emphasis on exports and expansion of its merchant marine.

2.06 As a result of the development of the highway network since 1968, rail/road competition has grown keener, particularly for passenger transport for which highway transport during the last decade progressively increased its share to nearly 75% of all pass-km. Also, the railway is meeting strong competition from trucks for short and medium distance freight traffic because of the flexibility of service and increasing trans-shipment costs from rail to trucks to reach the final destination. Undoubtedly, the virtual monopoly enjoyed by the railway only a decade ago has now ended, and the transport system is evolving through competition toward a more balanced multi-modal pattern where the different modes will complement each other.

Highways

2.07 The present highway system is still inadequate to cope with the rapid growth of road transport, despite the Government's effort since 1968 to catch up with the backlog of necessary road improvements. Only about one-half of national highways and less than 20% of other roads are paved. This situation will require a continued high level of investment.

Railways

2.08 Korean National Railroad (KNR) at the end of 1973 operated 3,068 route-km of standard gauge, of which 529 km are double track. Electrification of some 321 km of industrial lines from Seoul to the northeast coast (carrying mostly mineral traffic) was completed in October 1975. Also about 100 km of suburban lines have been electrified, and a subway in the Seoul area was opened in 1974.

2.09 The railway is expected to retain its share (nearly 80%) of bulk commodity movements in line with its operational improvements and additional rolling stock. Continued competition from other modes is expected for general freight traffic and for passenger traffic. The railway is likely to retain a significant amount of such traffic, but tariff adjustments will be required to effect a major improvement in its finances.

Ports and Shipping

2.10 Freight traffic through the ports has increased from about 11 million tons in 1965 to about 70 million tons in 1975. This sharp increase resulted in serious port capacity problems, particularly at Busan, the largest port, which handles 20% of the country's external trade and is chronically congested. Incheon, the nearest port to Seoul, is being expanded, with the assistance of the Asian Development Bank (ADB), through the addition of twenty deep-water berths, including five container berths. The project has been in partial operation since 1974, although two berths, the breakwaters and some ancillary works will not be completed until 1977. However, the facilities are substantially underutilized and are expected to remain so for many years because transport costs to and from the Seoul area are higher via Incheon than via Busan. The port suffers from the inherent disadvantage of a very high tidal variation, necessitating entrance locks which result in delays to shipping. Additional investment in container handling equipment, including cranes, will be required as the volume of containers increases.

2.11 In addition to the ongoing Bank-financed project, at Mugho 1/ and Busan (Loan 917-KO), the Government began, in 1975, construction of major port facilities, costing about US$200 million, at Bugpyeong, Pohang, and Onsan on the east coast, and at Samil on the south coast (Map 11700R). These facilities were designed and are being constructed by the Ministry of Construction (MOC) as integral parts of the site preparation and infrastructure for a number of industrial plants: Bugpyeong will handle bulk cement; Pohang's new harbor, inbound iron ore, coal, limestone and scrap steel, and outbound steel products from the expanded Pohang steel mill; Onsan, inbound petroleum products and raw materials for the non-ferrous metals smelters, and outbound products from these plants; Samil, imports of raw materials for, and outbound products from, a fertilizer plant and petrochemical complex. None of these port projects was included in the recommendations of the Korea Port Development Study - Phase I (KPDS-I) and therefore, according to the Loan Agreement

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1/ Previously spelled Mukho.

of Loan 917-KO (Section 3.11), they required the Bank's prior agreement. The Government, however, did not seek the Bank's agreement before starting the projects in the belief that industrial ports were not covered by the covenant. The Bank has drawn the Government's attention to this breach of the covenant; however, it should be recognized that the economic justification for such "industrial" ports largely depends on the economic justification for the associated industrial facilities, a difficult matter for the Bank to pursue. The Government intends to establish an Inter-Ministerial Committee to review industrial port development proposals (para 3.06).

2.12 Korea's share in the merchant shipping serving its external trade has been increasing and it is estimated that, in 1976, about 38% of the country's total foreign trade tonnage was carried by Korean vessels. The important role of coastal shipping is largely due to the country's geography and the Government's development of industrial complexes at Pohang, Ulsan and other coastal sites and to the existing shortage of rail and road capacity.

Aviation

2.13 Domestic passenger traffic carried by air is growing rapidly, but still amounts to only about 1% of the total. Domestic air freight traffic is negligible. Domestic routes are served by the privately-owned Korean Airlines (KAL), which also operates a number of international flights. There are international airports at Seoul and Busan, and at Jeju island, a major tourist center.

C. Transport Planning and Coordination

2.14 In spite of the efforts of the Government since 1970 to create institutions to improve transport planning, the investment decision-making process is still uncoordinated and dispersed among different Government agencies. The Economic Planning Board (EPB), is the central agency which is intended to provide a comprehensive overview of investment in all sectors. However, it has not been able to formulate an investment policy for the whole transport sector. Nor has it had the capability to review transport investment proposals by line agencies, and to assess the merits of alternative solutions in meeting the Government's objectives. However, EPB is establishing a mechanism for detailed review of major investments by all agencies of Government with a view to increasing its capability for analysis of transport investments.

2.15 The transport coordination function was reorganized in late 1975; the old Transport Planning Office of the Ministry of Transportation (MOT) was renamed the Transport Coordination Office (TCO) and has assumed responsibility for economic regulation of transport, particularly with regard to pricing and entry. A recent Bank sector mission has reviewed transport coordination and will make recommendations for the strengthening of this function.

2.16 Over-investment in port facilities, such as that at Incheon, reflects the present lack of port planning and the fact that project designs are frequently not based on careful analysis and projection of port operational

statistics. Furthermore, MOC is not responsible for operating the port facilities which it constructed. The establishment in March, 1976, of the KMPA, to plan and administer Korean ports should assist substantially in alleviating this problem. However, KMPA lacks staff with planning experience and, therefore, appropriate training is proposed (para 4.02 (e) and Annex 1).

III. PORT FACILITIES, ORGANIZATION AND OPERATIONS

A. Facilities, Existing and Under Construction (Map 10382R3)

3.01 The port of Busan has a natural harbor, further protected by breakwaters, the northern section of which handles commercial shipping, while South Harbor handles fishing vessels and other small craft. The entrance channel has 12 m (40,000 dwt ships) water depth and is being deepened to 13.5 m (60,000 dwt) as part of the ongoing bank-financed First Port Project (Loan 917-KO). Maximum tidal range is 1.2 m.

3.02 Berthing facilities currently consist of about 4,100 m available at four finger piers, and at a central wharf; the south side of pier 3 and part of the central wharf are used for military cargo. Oil traffic is handled in the outer harbor, while 95% of the timber imports are unloaded in the stream. There are about 3,000 m of lighterage wharf and 24 ship anchorages with 5 m to 13 m depth. Adequate privately owned lighters are available; the port has four ship-handling tugs. Containers are handled with ships' own gear, and with a recently installed container crane on the north side of Pier 3, directly onto semi-trailers, because there is no space for stacking them at the pier. Ample transit shed and open storage space is available but needs modernizing, and lighting and water supply are inadequate at present, although improvements are being made under Loan 917-KO. Mechanical equipment for handling general cargo is largely privately owned.

3.03 The berthing facilities are being substantially expanded under the ongoing First Port Project to be completed in July 1978. The project includes: (a) composite pier with 600 m of container ship berths, and a grain berth and silos; (b) Pier 7 for bulk coal and minerals; (c) rehabilitation of piers 1 and 2, which will include provision for an international ferry terminal, with roll-on/roll-off facilities; and (d) a coastal ferry terminal. A new Government-financed military pier will free pier 3 and the central wharf for commercial cargoes. Full details of port facilities as they will be following completion of the First Port Project are shown in Annex 2.

3.04 With the completion of the proposed project, the port will have reached the limits of its physical capacity. It will be necessary, therefore, to look elsewhere to meet port expansion needs in southeast Korea beyond about 1985. The Government intends to conduct a study for port expansion in due course.

B. Organization

3.05 In March 1976, following a 15-month study by consultants financed under Loan 917-KO, KMPA was established under the MOT for the purpose of

administering the construction and operation of Korea's 20 first-class ports. The 23 second-class ports and numerous minor local ports continue to be operated by local government officials. KMPA administers the first-class ports through ten District Port Authorities. Key personnel were appointed in April 1976, and personnel from MOC's Bureau of Harbor Development have since been transferred to KMPA to staff the construction and maintenance function. The organizational structure (Chart 16452) is acceptable, although containing some overlapping of functions at present. The Korea Dredging Corporation has been transferred from MOC to MOT, and harbor dredging at first-class ports will now be under the control of KMPA.

3.06 Construction of "industrial ports," forming part of industrial complexes, continues under the control of MOC, which is responsible for construction of industrial complexes. While this is a reasonable division of responsibilities, KMPA's responsibility for overall planning of Korean ports needs to be clarified with respect to the planning of industrial ports, since the present law is not specific on this point. The Government has agreed to establish an Inter-Ministerial Committee under the chairmanship of the Vice-Minister of EPB, to review MOC's proposals for industrial port development, and will take whatever other action may be required to ensure that the views of MOT and KMPA on proposed industrial port developments are taken into account before they are approved by EPB.

C. Finances

3.07 Section 3.02 (c) of the Loan Agreement for Loan 917-KO provided that " ... KPA (KMPA) shall have independence and autonomy similar to that of Borrower's statutory corporations in their day-to-day operations". (The finances of statutory corporations are controlled under Law 1119.) However, the Plan of Action (Schedule 5 of the Loan Agreement) required the Government, by June 1, 1975, "... to establish KPA (KMPA) pursuant to Section 3.02 (b) of this Agreement as an Office (chong) ...", which was stated during negotiations to have powers similar to those of a statutory corporation. In fact, the finances of a chong are controlled by Law 928 (Accounting and Budget Law for Government Operated Enterprises), through the Government budgetary system (Annex 3). KMPA was established under Law 928, which contains constraints impeding effective management of KMPA as a business enterprise, the principal of which are: (a) financial control is exercised through expenditure limitation rather than through operating performance as measured by overall financial results; (b) control authority relating to operating costs is exercised outside KMPA; (c) commercial accounting procedures, necessary for proper internal management, have to be carried out in parallel with the budget accounting procedures required by Law 928. The Government intends to amend Law 928, with effect from January 1, 1979, so as to provide all Government operated enterprises with greater flexibility in the use of their approved operating budgets. In addition, the Government has agreed to grant KMPA, by the same date, the power to incur debt, to fix the emoluments of its staff, to prepare its budgets in commercial form (Annex 4), to maintain a bank account, and to maintain its records in a commercial form.

D. Cargo-Handling Operations

3.08 KMPA is nominally responsible for cargo-handling operations on the wharf but, in fact, it exercises little influence over the operations of the numerous private licensed operators who handle cargo at all piers. The efficiency of cargo-handling operations is low, due to (a) fragmentation of responsibility between the various cargo-handling companies and waste of time and effort due to lack of coordination; (b) inadequate mechanical equipment and pallets, which are often used only when manual labor is incapable of the task; (c) excessive use of lighterage, resulting in low productivity; (d) use of transit sheds for long-term storage; (e) excessive documentation, particularly those of Customs, which requires forms even for cargo movement within the port; and (f) Customs control over cargo movements within the transit sheds.

3.09 The organization of cargo-handling operations has been studied by a consultant (Booz Allen & Hamilton - US) financed under Loan 917-KO. The consultant's recommendations have been discussed with KMPA, and the following measures to improve the efficiency of operations have been agreed with the Government:

(a) at the ports of Busan, Mugho and Incheon, a single TOC will be appointed by March 31, 1978, on terms satisfactory to the Borrower and the Bank, to manage cargo handling operations exclusively at each of the bulk piers; and, by a date acceptable to the Bank, at each of the bulk piers of the other first class ports. For this purpose, the Bank will approve a standard form of contract applicable to all locations;

(b) at Busan's container wharf, a single terminal operating company (TOC), with personnel drawn from the existing container terminal operators, will be appointed, by March 31, 1978, on terms satisfactory to the Borrower and the Bank (Annex 5), to manage container handling operations;

(c) at the ports of Busan, Mugho and Incheon, a single TOC will be appointed by March 31, 1979, to manage break bulk cargo-handling operations exclusively at each pier or other designated area; and by a date acceptable to the Bank, at each of the other first class ports. For this purpose, the Bank will approve a standard form of contract applicable to all locations;

(d) by July 1, 1982, or such other date as the Borrower and the Bank may agree, when KMPA staff have gained sufficient experience of supervising the TOC's cargo-handling operations, control of such operations will be taken over by KMPA;

(e) by July 1, 1978, improved procedures for the control of cargo movement within the Customs area will be implemented; and

(f) at the port of Busan, the container wharf, including the container freight station, will be operated 24 hours a day.

3.10 The assumption by KMPA of a supervising and coordinating role in cargo-handling operations will necessitate their hiring a nucleus of staff experienced in cargo-handling operations. In order to recruit such operations staff in competition with private companies, the Government has agreed to allow KMPA to fix the emoluments of its staff appropriately.

3.11 By 1978, when the new container wharf at Busan comes into operation, the staff of Busan District Maritime and Port Authority (BDMPA) should have a thorough understanding of its operating requirements. Some technical assistance in this regard is being provided under Loan 917-KO; additional technical assistance and training is now proposed (para 4.02 (e) and Annex 1), including overseas training at suitable ports.

IV. THE PROJECT

A. The Capital Investment Program

4.01 The Capital Investment Program for the port of Busan for 1976-81 totals about US$269 million equivalent (Table 1). It comprises expenditures on the First Port Project through 1979; on the proposed project through 1981; and on minor capital works throughout the period 1976-81. As already noted, with the completion of the proposed project, Busan port will have reached the limits of its physical capacity and, therefore, the program includes no additional major project.

B. The Project

4.02 The project is included in the Government's Fourth Five-Year Plan and is in accordance with the recommendations of the consultants as amended following the Bank's review of their proposals. The proposed wharf is the maximum length which can be accommodated in the present port of Busan, and it would meet the port's needs for capacity to handle containerized cargo until about 1985. Specifically, the project would comprise:

(a) Civil Works

(i) A 700 m extension of the common-user container berths being financed under Loan 917-KO and a 335,000 m^2 expansion of the stacking area provided under that project;

(ii) dredging to provide an alongside depth of 12.5 m;

(iii) an access road, inside the port limits; a guard house; and an 8,000 m^2 container freight station;

(iv) ancillary works and utilities; and

(v) rehabilitation of piers 3 and 4, the central wharf, and a lighter wharf.

(b) Mechanical Equipment

Procurement of container cranes and mobile container handling equipment.

(c) Floating Craft

Procurement of two tugboats.

(d) Engineering Consultant Services

To carry out detailed design and supervision of construction and procurement of the above.

(e) Technical Assistance and Training Program (Annex 1)

To assist in four areas of port operations: cargo handling (including the handling of containers); maintenance; port planning; and accounting.

Full details of the project are given in Annex 6. Provision has been made in the cost estimates for roll-on/roll-off facilities as traffic development dictates. To ensure proper maintenance of the container handling equipment, the project includes maintenance facilities and technical assistance to establish an adequate maintenance program.

4.03 The total estimated project cost is US$112 million (Won 54,283 million). The proposed loan of US$67 million (Won 32,495 million) would finance most of the foreign exchange cost of the project; the local currency, about US$42 million (Won 20,334 million) and US$3 million (Won 1,455 million) of the foreign exchange cost would be financed by the Government. Details of the project cost estimates are given in Table 2 and are summarized below:

		Won Equivalent (Million)			US$ Equivalent ('000)			% of Total
		Local	Foreign	Total	Local	Foreign	Total	Cost
A.	Civil Works	9,904	12,142	22,046	20,420	25,040	45,460	41
B.	Mechanical Equipment and Tugs	1,054	8,536	9,590	2,170	17,600	19,770	18
C.	Engineering Services	581	1,940	2,521	1,200	4,000	5,200	5
D.	Technical Assistance and Training	150	582	732	310	1,200	1,510	1
E.	Base Cost Estimate (BCE)	11,689	23,200	34,889	24,100	47,840	71,940	-
F.	Physical Contingencies	1,485	1,821	3,306	3,060	3,750	6,810	6
G.	Expected Price Increases (38% BCE)	5,060	8,928	13,988	10,435	18,410	28,845	25
H.	Customs Duty on B	2,100	-	2,100	4,330	-	4,330	4
	TOTAL	20,334	33,949	54,283	41,925	70,000	111,925	100

4.04 The cost estimates for civil works are based on preliminary designs and unit prices for similar ongoing works in Korea, and those for mechanical equipment on recent purchases, both at late 1976 prices; they are considered adequate. Physical contingencies are equivalent to 15% of the civil works. Expected price increases in foreign exchange for civil works have been calculated, over the period from late 1976 to the completion of construction, at 12% in 1977-79, and 10% in 1980 and 1981; and for mechanical equipment and tugs, at 8% in 1977-79 and 7% in 1980 and 1981.

C. Project Execution

4.05 The project will be carried out by KMPA, assisted by consultants.

D. Consulting Services

4.06 The Government is about to appoint consultants for supervision of construction and detailed engineering, including final soil investigations, hydrographic and other surveys (Annex 6). Specialist consultants will also be required for the technical assistance and the training program (Annex 1), including 82 man-months of expatriate consultants at an estimated cost of US$510,000 excluding travel and related expenses.

E. Procurement and Disbursement

4.07 The project would be executed under three civil engineering contracts, and two procurement contracts for mechanical equipment and tugs (Table 3). All contracts would be awarded on the basis of international competitive bidding in accordance with Bank Group guidelines. The Government intends to levy import duties on items procured for the project. Provision would be made to allow a 15% preference for local manufacturers of mechanical equipment and floating craft, in accordance with the Bank's guidelines.

4.08 The works are expected to be completed by the end of 1981, assuming effectiveness of the proposed loan by July 1977. The construction schedule is shown in Chart 16510.

4.09 Disbursement for the project civil works would be on the basis of 55% of total costs excluding import duties, representing the estimated foreign exchange component. This is based upon experience gained on civil works under the First Port Project, where all civil works contracts were won by Korean contractors. For procurement of mechanical equipment, tugboats, and consulting services disbursement would be on the basis of actual foreign exchange cost; if local consultants are employed disbursement would be on the basis of 80% of total costs. Korea does not have any regional preference agreements. Annual estimated project expenditure is shown in Table 4 and the estimated schedule of disbursements in Table 5.

F. Ecology

4.10 None of the proposed works will affect the existing ecology of the harbor; any dredged material will be disposed of in a Government-approved location 10 km to sea. Any improvement to the external access roads will be designed following a proposed feasibility study, which will assess any likely environmental impact (para 5.04).

V. ECONOMIC EVALUATION

A. General

5.01 The current rapid industrialization in south east Korea is very dependent on imports for supplies of industrial goods and raw materials, and on export markets for its products. This large and fast-growing external trade moves largely through Busan port which, as already noted, is Korea's largest port. In addition, the port handles a substantial volume of containerized goods originating in, or destined for, the Seoul area. Without the proposed project, all this traffic would suffer heavy penalties, in the form of higher transport costs, and south east Korea's economic development would be seriously retarded as a result. The full economic costs of such a course are incalculable, but certainly very substantial. As a conservative measure of these costs, the evaluation uses the cost of ship waiting time which would result in the absence of the proposed project. The project would also reduce transport costs on containerized cargo (paras 5.10-5.12).

5.02 Total traffic through Busan port has grown from 13.3 million revenue tons in 1973 to 16.8 million tons in 1975, and is expected to reach about 19 million tons in 1976 (Table 6). Containerized cargo has grown even more rapidly, increasing from 0.9 million tons in 1973 to 2.7 million tons in 1975. In 1976 it is expected to exceed 3 million tons. This rapid growth in containerized cargo has been achieved notwithstanding the present inadequate port facilities. Completion of the First Port Project in 1978 will permit the introduction of direct services by mainline container ships (para 5.12), and will facilitate continued rapid growth of container traffic. The proposed project will be required by about 1981 to handle this expected traffic growth efficiently and, therefore, construction must start about January, 1978.

5.03 The proposed project would encourage the use of larger, more efficient ships; however, since it is uncertain whether the benefits of this would accrue to Korea, no benefit has been taken. The proposed facilities would be substantially lower in capital cost than equivalent break-bulk facilities. Consultants for the project reviewed a number of alternative sites in the vicinity of the present port of Busan and a number in the vicinity of Masan, and concluded that the proposed site is the lowest cost alternative.

B. Landward Port Access

5.04 The roads giving access to the port are congested. They pass through Busan's central business district, which lies to the west and north of the port. While traffic generated by the proposed project will not itself contribute significantly to the problem, the growth of general city traffic is likely to result in steadily increasing transport costs on all goods moving in and out of the port and, ultimately, could limit the port's capacity unless appropriate steps are taken to improve the city's road network. In November, 1976, a Presidential instruction was issued to the MOC to construct a road from the port area to the Seoul/Busan expressway; construction is expected to be completed by December 31, 1979. This will eliminate any congestion affecting traffic moving between the port and the Seoul area, and should help to relieve congestion in the central business district of Busan. In addition, the Government has agreed to undertake, by the end of 1979, a further study, satisfactory to the Bank, of city-wide transport and land use which will seek medium-term solutions to the city's congestion and assess their feasibility. The Government has agreed to consult with the Bank on the study's findings and to implement its agreed recommendations.

C. Traffic Forecast

5.05 The traffic forecast is based on a detailed commodity-by-commodity projection, for the whole of Korea, of production and consumption patterns and resulting import and export flows and coastal movements. These traffic flows were allocated to the country's ports on a basis of the least transport cost, and take account of established patterns of trading. The forecast's underlying assumptions include an 8% annual growth in GNP from 1977-81, a 6.5% annual growth in real per capita income, and an 11% overall annual growth in exports between 1973 and 1981. Projections for each major commodity group take account of past trends, current official plans and anticipated changes in the outlook for the supply of materials and the demand for the final products.

5.06 Total port traffic is forecast to grow from an estimated 19.1 million revenue tons in 1976 to 31.2 million tons in 1986, an average annual growth rate of 5% (Table 6). General cargo, including containerized cargo, is forecast at a 4-1/2% annual growth rate, increasing from 8.1 million tons in 1976 to 12.6 million tons in 1986. Full details of the forecast are contained in Annex 7.

5.07 The proportion of general cargo which is expected to be containerized is forecast to increase from the present 44% for imports and 40% for exports to 60% for imports and 52% for exports by 1984. The higher figure for imports reflects the imbalance between imports and exports which provides an inducement to containerize as high a proportion of imports as possible rather than to ship in empty containers. The number of containers is forecast on the basis of the current average revenue tons per container. Throughout the forecast period it is expected that a substantial proportion of Seoul container traffic will continue to move through Busan. However, as the volume increases, it will become economic to make an increasing number of shipments through Incheon.

5.08 The principal risk in the forecast relates to the volume of containerized cargo, since the past very rapid growth provides no guide as to future traffic trends. If the proportion of containerized general cargo is less than forecast, the need for additional break bulk berths will be brought forward, as will the need for an alternative site to the present port for future expansion. A higher forecast of container traffic would have no effect on the scope of the project which, as already noted, is the maximum size which could be constructed in the port of Busan. The effect of over-estimation of container traffic on project benefits is dealt with in para 5.14.

D. Project Benefits and Risks

5.09 Without the proposed project, it would be desirable to route all Seoul container traffic via Incheon. Other container traffic together with break bulk and bulk cargo (about 80% of total port traffic) would continue to move through Busan. Such a rerouting of Seoul containers would require some additional investment at Incheon in container handling equipment and would inevitably lead to ship waiting time at the entrance to the port due to delays in passage through the locks. The calculation of project benefits does not include allowance for either of these factors (para 5.10). Even if the shipping companies elected to ship all Seoul containers through Incheon severe congestion would still develop in Busan without the project. Berth occupancy would increase steadily to 85% in 1982 and, by 1985, the port would be saturated. This assumes an increase in productivity of break bulk general cargo handling from the present 850 metric tons per meter per year to the high performance standard of 1,000 tons per meter, and congestion would be increased by any failure to achieve this higher productivity. Ship waiting time would increase correspondingly and, by 1985, would reach about 2,800 ship days a year. The economic costs of the waiting time of Korean ships (excluding, that is, the cost of foreign ships) are estimated to increase from US$1.3 million in 1981 to US$9.7 million in 1985 and, thereafter, are assumed to stabilize at US$10 million a year (Table 7). It should be emphasized that there are additional economic costs of congestion at Busan in terms of the retarded

economic development of the region, which have not been estimated but would probably continue to rise after 1985.

5.10 If Seoul container traffic were directed through Incheon rather than Busan, the cost of ocean freight plus road transport between Incheon and Seoul would be about US$12 per container more than the cost of ocean freight to or from Busan plus road transport between Busan and Seoul. The extra cost would amount to about US$1.8 million in 1981 rising to US$2.3 million in 1985 and has been taken as a benefit of the project. These figures are based on the relatively high volume of 400 containers in and out per vessel, and would increase if fewer containers per vessel are handled. No allowance has been made for the inevitable ship waiting time which would occur as a result of delays in passage of vessels through the locks at Incheon. If Seoul container traffic were routed through Busan some extra ship waiting time would also result, even with the proposed project; however, this would be unlikely to exceed the ship waiting time which would occur at Incheon if the traffic were routed that way.

5.11 The proposed container freight station at Busan would reduce the number of containers which would have to be transported to and from container yards outside the port from 70% of the total, following completion of the First Port Project, to 40%. This saving of transportation and double handling costs on 30% of the container volume is estimated at US$48 per container, or about US$4 million in 1981. The 40% of containers which would continue to move outside the port comprises largely Seoul container traffic.

5.12 At present, because of the inadequate facilities, there are no direct mainline container shipping services to Busan, and containers are transferred between mainline container ships and feeder vessels at a Japanese port, at a cost of US$210 per container, and are then transported in the feeder vessels to and from Korea. The cost of transshipment at the Japanese port, and transport between there and Korea is at present included in the rates charged by the mainline container shipping companies, who quote rates on a "FOB Korean port" basis (or "CIF Korean port" in the case of shipments to Korea). Completion of the First Port Project will permit the introduction of direct mainline container services to Busan and will thus eliminate the Japanese transfer cost on about 25% of Busan's 1981 container traffic. The proposed project would permit a further increase in the proportion of direct container shipments and the Japanese transfer cost is expected to be eliminated on all but 25% of Korea's container traffic. The benefit of this will accrue initially to the foreign shipowner and, therefore, it has not been included in the project benefits. However, in the long term, it can be expected to have a favorable influence on container shipping rates to Korea.

5.13 The proposed facilities are designed to serve mainline container ships; if they had been designed for smaller ships, such as semi-container vessels or the present feeder vessels, a smaller project at a lower cost would have sufficed. Based on the experience of such ports as Singapore and Port Klang, it is believed that competition among container shipping companies and growing congestion in Japanese ports will assure the rapid institution of mainline container services direct to Busan. The Government has agreed to continue to permit foreign vessels to serve Korean ports in accordance with

the provisions of Article II (2) of the Merchant Marine Promotion Law. 1/ In addition, it plans to charter, by 1981, a substantial number of container ships and to operate them between Korean ports and ports in the United States and Europe. It is reasonably certain, therefore, that the full benefits of the project will be derived. The plans for Korean container ships and the Government's undertakings regarding port charges (paras 6.03(d) and 6.17) provide assurance that a reasonable proportion of the project's benefits will be retained in the Korean economy.

5.14 In the unlikely event that the proportion of traffic which is containerized has been over-estimated, the benefits mentioned in paras 5.10 and 5.11 would be reduced. However, the reduction would be partially offset by the benefits from the project through the reduction of ship waiting time which would otherwise be increased because the higher proportion of break bulk cargo would reduce average cargo-handling productivity and thus increase port congestion. The net effect on project benefits would be a maximum reduction of 15% (para 5.16).

E. Economic Return, Sensitivity Analysis and Risks

5.15 The foregoing benefits yield an economic return of 17% on the proposed project. The first year return at 8% is low but considered adequate having regard to the fact that the penalties, in the form of higher ship waiting time which would be incurred if Busan port traffic has been underestimated, are substantially greater than the penalties in the form of surplus port capacity, which would be incurred if port traffic has been overestimated. Delay in implementing the project could have very serious consequences for the Korean economy.

5.16 The 15% reduction in project benefits (para 5.14), resulting from a lower proportion of container traffic than forecast would reduce the return to 14%.

VI. FINANCIAL EVALUATION

A. General

6.01 BDMPA is expected to be a division of KMPA, maintaining separate accounts, but in the financial forecasts, it has been treated as if it were a financially autonomous unit, and therefore its balance sheets show the relevant portions of Loan 917-KO and the proposed Second Port loan as if they were liabilities of BDMPA. The Government has agreed that, upon the granting of increased financial autonomy to KMPA on January 1, 1979, it will assume loans to the Government in the same amounts and on terms similar to those of Loan 917-KO and the proposed Second Port loan. No financial forecast has been provided for KMPA because the necessary data will not exist until commercial accounting has been established.

1/ Law No. 1985 dated February 28, 1967 - Article 11 (Usage of Korean Flag).

B. KMPA's Accounting and Costing Systems, Rates and Charges

6.02 Consultants financed under Loan 917-KO (Booz, Allen & Hamilton - US) have designed new accounting, costing and management information systems for KMPA, which plans to implement the systems in the near future with the aid of technical assistance, also financed under that Loan, and in accordance with agreed terms of reference.

6.03 The adequacy of port tariffs varies from port to port. While in some ports they are clearly inadequate, in Busan they are, at present, not cost-based and charges for containerized traffic are low. The Government has agreed to;

(a) establish in Busan not later than January 1, 1979, a cost-based tariff satisfactory to the Borrower and the Bank;

(b) review tariffs at other ports within KMPA's jurisdiction and, as an interim measure, with a view to eventually establishing cost-based tariffs, to establish, by January 1, 1979, tariffs which will yield revenues reasonably in line with total costs at Incheon, Mugho, Yeosu and Pohang, and at other major ports later, in agreement with the Bank;

(c) establish at Busan, by May 1, 1978, a uniform tariff for each 20 ft equivalent container unit handled in the port; and, to this end, the Borrower will undertake a study (Annex 1) of the level of container charges at Incheon and Busan; and

(d) establish at Busan, before July 1, 1978, a charge to each TOC employed in the port, which will recover the port's costs of servicing and maintaining the pier and equipment used by the TOC together with depreciation, and a return on capital (para 6.12).

C. KMPA's Asset Values and Depreciation

6.04 The present port assets are old and in poor condition. There are no records of the original cost of many items. In 1975, the Government appointed a Working Party which revalued all existing assets in use throughout the country (Annex 8). These valuations, which are reasonable, are used in the current estimates.

6.05 The depreciation provisions appear to be low, particularly in the case of ports other than Busan. The Government has agreed to adopt by January 1, 1982, realistic depreciation rates for KMPA's port assets. Until 1982 the injection of newly acquired fixed assets far exceeding the value of Busan's existing old assets will minimize the need for revaluation to take account of inflation. Consideration should then be given to this problem. However, it is considered premature to address the issue at this time in view of the more urgent matters facing KMPA.

D. BDMPA's Receivables, Payables and Stores

6.06 Under the Government budgetary system (Annex 3) there is no meaningful cash balance, and accounts receivable are not kept. The figure of Won 11 million shown in the 1975 balance sheet represents wharfage and demurrage which had already been invoiced but not paid at the year end; the port charges due, but not invoiced, at the year end are not recorded or known. Similarly, no record of accounts payable is maintained under the cash budgetary system, the amount of Won 691 million shown in the balance sheet as at December 31, 1975 representing only major items outstanding for contractors' and consultants' accounts awaiting IBRD loan disbursements, and interest and commitment charges payable to the Bank on February 1, 1976. No stores accounts are kept, purchases being regarded as current expenditure regardless of the period in which the stores concerned were actually used. In general, port operations are so conducted that accounts receivable and payable are very low in relation to turnover, and few consumable stores are kept on hand.

E. Financial Staffing

6.07 There are no qualified accountants in BDMPA, nor any accounting staff familiar with double-entry bookkeeping. Furthermore, the level of salaries which KMPA is at present authorized to pay makes it difficult to attract and retain suitably qualified accounting staff, since they can earn far more in the private sector. In future, the payment of special allowances or employment under contract, to which the Government has agreed, should minimize this problem. However, it is essential that KMPA acquire, or develop through a training program, sufficient qualified accountants and the proposed project provides consultancy assistance to set up training courses for accountants.

F. BDMPA's Past and Current Earnings and Current Financial Position

6.08 BDMPA's revenue and expenditure accounts and balance sheets as presented for 1973-75 are according to the best available data and constitute an adequately reliable basis for appraisal purposes.

6.09 Comparable gross and net earnings figures for Busan are available only on a cash basis for the three years 1973, 1974 and 1975. The true figures are unlikely to differ significantly from the cash figures.

6.10 Cash revenues, cash operating costs, depreciation and interest charges on an accrued basis for the three years 1973-75 are shown in Table 8. In 1975, net operating revenue was Won 1.3 billion representing a modest return of 6% on average net fixed assets in use, and the operating ratio was a satisfactory 42. Under the Government budgetary system neither current nor liquidity ratios would be meaningful because there is no cash balance as such.

6.11 The development of port charges and net revenue over the period 1973-76 has been reasonable in relation to the book value of port assets. In part, this improvement resulted from the tariff increase established in 1974 as a condition of Loan 917-KO.

G. Establishment of Terminal Operating Companies (TOCs)

6.12 At present, the ports do not charge the cargo-handling companies for the use of port assets. This is not acceptable and when, in 1978, TOCs are appointed with exclusive right to operate at individual piers, BDMPA will establish charges to the TOCs which are related to the value of the port's assets used by each.

6.13 Accordingly, BDMPA's projected profit and loss account shows revenue derived from such charges to the TOCs. Estimates of operating and maintenance costs of the equipment provided under Loan 917-KO and to be provided under the proposed project are included in forecast operating expenses.

6.14 In about 1982, when BDMPA assumes responsibility for all cargo-handling functions it will incur some additional costs and revenues belonging, until that time, to the TOCs. No information is available on these costs and, for this reason and because the takeover lies essentially outside the forecast period, no attempt has been made to forecast the effect of such an extension of responsibility.

H. BDMPA's Future Earnings and Finances

6.15 Financial forecasts for BDMPA for 1976-82 together with actual figures for 1975 are shown in Tables 9, 10 and 11, these being respectively profit and loss accounts, balance sheets and cash flow statements. Inflation has been taken into account in forecasting working expenses. Major tariffs were increased by 25% in March 1977. It is assumed that tariff charges will be further increased in line with the assumed increases in the general price level in Korea. Furthermore, the forecasts assume that specific tariff increases will be made, in particular, for bulk handling and container activities to recoup the additional expenditure incurred as a result of the capital expenditure program (para 6.17). All assumptions used in the financial forecasts are detailed in Annex 9.

6.16 Completion in 1978 of the First Port Project will change the financial picture dramatically. Operating costs in 1978, will be more than four times the 1977 level, due largely to increased depreciation. Increased charges for maintenance due to the costs of running the new bulk handling equipment, and for port administration, due to the increased number and quality of staff, will also contribute to the higher operating costs. Depreciation charges, which remain very low through 1977, will suddenly increase, in 1978, about seven times. Interest charges on the IBRD and Saudi Fund for Development loans relating to Loan 917-KO will have reached their peak, and will be running at a level nearly four times as high as the charges in 1976.

6.17 To provide for these developments, charges against TOCs and shipping companies equivalent to US$58 per container have been assumed to occur on July 1, 1978, rising to US$68 on July 1, 1981. In practice such charges will be imposed selectively with regard to the cost of wharf facilities and mechanical equipment used for each type of cargo i.e. bulk cargo, containers and break bulk. Studies financed under Loan 917-KO have indicated that increases

in the Busan port dues and cargo tariffs on the scale called for could reasonably be imposed. In relation to the efficiency of the port, and the present absence of delays to ships seeking berths, existing charges (particularly for containers) are low. The total charges for clearing a container in or out of the port amount at present to about US$20 per movement, of which roughly half goes to the stevedores. In other parts of the world the comparable charge can run from US$100 to as much as US$180. The estimated total revenue from charges to be levied against TOCs has been assessed relative to the fixed assets likely to be used in such operations.

6.18 BDMPA's operating ratios are exceptionally low in 1976 and 1977, before the completion of the First Port Project; thereafter the ratios range between 44 and 48, which is satisfactory. Times interest earned is lowest in 1978 at 1.5x and is satisfactory during the other forecast years. Debt service coverage is lowest in 1981, when it falls to 1.5x; but it recovers to 1.8x in 1982 because of increasing revenues and falling interest payments.

6.19 BDMPA's estimated balance sheet data for the years 1976-82 are shown in Table 10. The debt/equity ratio rises to only 53/47 (in 1981) and improves to 49/51 in 1982. Current liquid ratios range between 1.1 and 1.6 during the project construction period, which is satisfactory.

6.20 The forecasts result in net operating revenue representing between 7.6% and 7.9% p.a. on BDMPA's average net fixed assets in use during the period 1978 to 1982 inclusive i.e., after the completion of the First Port Project and before total net asset values start declining after the completion of the Second Port Project. The Government has agreed that BDMPA be required to earn a return of not less than 7% in 1978 and subsequent years. This replaces the rate of return covenant of the Loan Agreement for Loan 917-KO (Section 4.05 (a) (iii)), which requires BDMPA to earn a return of not less than 6% on its net fixed assets in 1978 and subsequent years. Section 4.05 (a) (iv) of this Loan Agreement, which requires KPA (KMPA) to earn in 1978 and thereafter an annual rate of return to be agreed between the Borrower, the Bank and KPA (KMPA), has been reaffirmed.

I. BDMPA's Cash Position and Financial Plan

6.21 Estimated cash flow data for the forecast period are set forth in Table 11. The cash position is made satisfactory by the inclusion of cash grants in the form of equity from the Government/KMPA totalling Won 9.9 billion during the years 1977/78. On this basis, the future cash position will be satisfactory, although BDMPA will not be able to start building up substantial cash funds until after 1981 unless tariffs or charges to TOCs are increased more than in the forecasts in Table 9. The disposal of the accumulated cash funds arising from then onwards will be a matter for the Government and KMPA to decide in the light of its overall corporate position from time to time. Based on all assumptions referred to herein, the future cash position will be satisfactory. The financial plan (Table 12) based on cash flow estimates indicates that for the period 1975-82, internally-generated funds would provide 25% of investment fund requirements, with Government/KMPA grants accounting for about 14%, and long-term loans 61%. These proportions are satisfactory.

6.22 To ensure that an adequate financial position is maintained, the Government has agreed that (i) KMPA will not incur new debt on behalf of BDMPA if the net revenue falls below 1.5 times maximum debt service; (ii) the Government will provide or cause KMPA to provide to BDMPA such funds as BDMPA shall require over and above its internally-generated cash, from time to time, to enable it to implement its development program; and (iii) expenditures on capital works at BDMPA other than the First and Second Port Projects, will be limited to US$1.5 million p.a. after 1978 and until construction of the Second Project is completed.

6.23 The Government has confirmed that the port's assets, at present vested in the Government, net of the debts to be assumed, will be transferred to KMPA free of interest or charges thereon.

J. Auditing and Insurance

6.24 From January 1, 1979, when KMPA's financial autonomy is increased, its accounts and financial statements, including those for BDMPA, will be audited annually by independent qualified auditors satisfactory to the Bank, in accordance with the requirements of Loan 917-KO. This has been reaffirmed. KMPA will employ qualified accountants to assist it in preparing commercial form financial statements from its budget accounts, for purposes of reporting to the Bank, and in implementing a commercial accounting system.

6.25 Under the conditions of Loan 917-KO, KMPA is required to take out, and maintain with responsible insurers, or to make other provision satisfactory to the Bank for, insurance against such risks and in such amounts as shall be consistent with appropriate practice. This has been reaffirmed by the Government.

VII. AGREEMENTS REACHED AND RECOMMENDATION

7.01 Agreement has been reached that the Government will:

(a) establish an Inter-Ministerial Committee to review MOC's industrial port development proposals and will take whatever other action is required to ensure that KMPA's views are taken into account before they are approved by EPB (para 3.06);

(b) amend Law 928 to grant KMPA certain autonomous financial powers (para 3.07);

(c) cause KMPA to implement measures to improve the efficiency of operations at all first class ports (para 3.09);

(d) allow KMPA to fix the emoluments of its staff at appropriate levels (para 3.10);

(e) construct a road from the port area to the Seoul-Busan expressway by December 31, 1979; and undertake a study of city-wide transport and land use (para 5.04);

(f) continue to allow foreign vessels to serve Korean ports (para 5.13);

(g) as from January 1, 1979, cause KMPA to assume loans to the Government in the same amounts and on similar terms to those of Loan 917-KO and the proposed loan (para 6.01);

(h) cause KMPA to establish (para 6.03);

(i) at Busan, a cost-based tariff;

(ii) at Incheon, Mugho, Yeosu and Pohang, tariffs yielding revenues reasonably in line with total costs; and extend this practice to other major ports later, in agreement with the Bank;

(iii) at Busan, a uniform tariff for containers; and KMPA to undertake a study of the level of container charges;

(iv) at Busan, a tariff of charges to each TOC (paras 6.03 and 6.12);

(i) cause KMPA to adopt realistic asset depreciation rates by January 1, 1982 (para 6.05);

(j) cause KMPA to (i) earn in 1979 and thereafter, a return to be agreed with the Bank and (ii) enable BDMPA to earn a return of not less than 7% in 1978 and subsequent years (para 6.20);

(k) not authorize KMPA to (i) incur debt on behalf of BDMPA if net revenue falls below 1.5 times maximum debt service; and (ii) make investments at Busan port in excess of US$1.5 million per annum during the project period (para 6.22);

(l) provide or cause KMPA to provide any funds required by BDMPA over its internally-generated cash (para 6.22);

(m) cause KMPA to have its accounts, and those of BDMPA, audited by independent auditors acceptable to the Bank (para 6.24);

(n) cause KMPA to employ adequately qualified and experienced accountants (para 6.24); and

(o) cause KMPA to maintain adequate insurance provisions (para 6.25).

7.02 The proposed project is suitable for a Bank loan of US$67 million equivalent to the Government of Korea for a term of 17 years, including a grace period of 3-1/2 years. KMPA will assume a debt to the Government in the same amount and on similar terms on January 1, 1979, following the necessary legislative changes.

KOREA

APPRAISAL OF SECOND PORT PROJECT

Technical Assistance and Training Program

1. The First Port Project (Loan 917-KO) provided 220 man-months of consultants' time to assist the Government set up KMPA and to formulate and implement new operating and accounting procedures. The first phase of this work is now complete. A second phase, consisting of the implementation of the procedures formulated in the first phase, will commence shortly. Continuing technical assistance and training is required, and the proposed program would provide 82 man-months of expatriate technical assistance to KMPA. It would cover three areas of port operations: cargo-handling; maintenance; and port planning. In addition, the Government will finance accounting training, undertaken by Korean accountants with the assistance of foreign experts, and a study of container handling charges. Details of the proposals are given below.

Cargo Handling

2. The present arrangements for handling containers in the port of Busan do not include stacking and retrieval or stuffing/unstuffing of containers, and operation and maintenance of container cranes and container handling equipment such as straddle carriers. The new container wharf, being constructed under the First Port Project, is expected to come into operation in 1978 and, by then, KMPA staff should have a thorough understanding of the operation of such a modern facility, to enable them to supervise the work of the terminal operating company (TOC). By 1982, KMPA staff should be capable of taking over the operation of the container wharf from the TOC.

3. The proposed training program would include overseas training, at a port such as Singapore, in container handling operations; operational control methods, including computerized systems; breakbulk handling operations; and security practices. It provides for:

(a) five groups of three staff and two foremen in container handling operations for three months;

(b) one group of three staff in operational control methods, including selection and use of computer equipment and software, for six months;

(c) one group of three staff and two foremen in breakbulk handling, for three months; and

(d) one group of three staff in security practices for three months.

4. Consultant services would be provided to review periodically container handling operations, following start-up of the Phase I facilities in July 1978, and to advise on improvements in operational methods, including computerization of the operational system.

Maintenance

5. Maintenance of port facilities, at present carried out by the Ministry of Construction (MOC), must be taken over by KMPA as soon as possible to ensure that adequate priority and funds are assigned to such work. Furthermore, following start-up of the Phase I container facilities in July 1978, KMPA will become responsible for maintaining all the container handling equipment in Busan port; and, about a year later, it will become responsible for the handling of breakbulk general cargo and, therefore, for the maintenance of equipment for this purpose.

6. Expatriate assistance would be provided to set up adequate maintenance facilities in each of the first class ports; to design a preventive maintenance program for cargo handling equipment, particularly the container handling equipment provided by this project and the First Port Project (Loan 917-KO); and to train staff adequately to act as maintenance inspectors.

Port Planning

7. Port planning, as distinct from the designing of port facilities, virtually does not exist in Korea. The Government does not, at present, make projections of port traffic based on carefully collected and analyzed traffic statistics. It tends to rely on port users to alert it to the need for expansion of port facilities. Also, it does not analyze the economics of alternative ways of meeting the demand for port facilities. While KMPA has well trained and capable port engineers, there is a general lack of planning experience, and a lack of knowledge of related non-engineering fields which are necessary for a good port planner.

8. Overseas training would be provided for two port engineers for six months each in techniques of port planning. In addition, expatriate assistance would be provided to set up the planning function, and to initiate plans for port facilities to meet the needs of Korea beyond 1985. Also, consulting services would be provided to develop a satisfactory collection system for operational statistics.

Accounting Training

9. At present, KMPA does not have any qualified accountants nor any staff that understand double-entry bookkeeping. While the First Port Project provided funds for the design and implementation of a commercial accounting system, it is essential to ensure an adequate supply of staff who understand the fundamental principles of accounting if the system which has been designed is to be successfully implemented and maintained. It is therefore necessary

to introduce a suitable course in the Ministry of Transportation Training Center in Seoul which KMPA staff would attend. A local accounting firm will be used for the purpose of setting up and conducting such courses. The services of expatriate experts will also be required for the implementation of the accounting procedures designed under the First Port Project.

Study of Container Handling Charges

10. The ongoing First Port Project and the proposed project will provide substantially improved facilities for container traffic and will, therefore, significantly reduce the costs of container shipping and handling companies. However, the new facilities will add substantially to the port's operating costs and, therefore, the port will have to adjust its tariff appropriately to cover these increased costs.

11. It is proposed that KMPA, using its own resources, undertake a study of the level of container charges which takes account of:

(a) the port's container handling costs;

(b) the present level of container charges at Japanese ports and at Incheon; and

(c) the need to maintain a differential between container charges at Busan and those at Incheon which reflects the economic costs of using each port and encourages increased use of Incheon's under-utilized facilities.

March, 1977

ANNEX 1
Table 1

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APPRAISAL OF SECOND PORT PROJECT

Technical Assistance and Training Program
Cost Summary

	Local Cost (Won '000)	Foreign Cost (US$)
Cargo Handling		
Overseas Training		
Other reimbursable costs	14,000	300,000
Consulting Services for Review of Container Operations		
6 man-months	-	40,000
Other reimbursable costs	7,500	30,000
Maintenance		
Expatriate Assistance in Setting up Maintenance Facilities		
48 man-months	10,000	300,000
Equipment	-	300,000
Other reimbursable costs	12,500	30,000
Port Planning		
Overseas Training in Port Planning	7,500	30,000
Expatriate Assistance in Port Planning		
16 man-months	10,000	100,000
Consulting Services for Operational Statistics Information System		
12 man-months	2,000	70,000
Training of Accountants		
Korean Consultancy assistance by qualified accountants		
24 man-months	80,000	-
Study of Container Handling Charges		
12 man-months	5,000	-
Other reimbursable costs	1,500	
TOTAL Won '000	150,000	US$ 1,200,000

March 1977

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APPRAISAL OF SECOND PORT PROJECT

Busan - Port Facilities Following Completion of First Port Project

Name and Type of Structure	Effective Length (m)	Available Depth (m)	Use	Remarks
A. Deep Water Berthage				
Pier No. 1				
Open pier with fill between aprons. Existing 95 m wide pier structure being widened by a further 101 m reinforced-concrete deck supported on concrete piles.	North 368 South 200	8.0 8.0	Public New International Ferry Terminal	Being repaired and expanded under the First Port Project
Pier No. 2				
Open pier with fill between aprons.	North 419 South 365	10.2 10.2	Public	Being repaired under the First Port Project
Pier No. 3				
Stone block gravity Caisson gravity	North 470 South 450	9.0 9.0	Public	Needs repairs to deck, and improvement of lighting and water supply
Pier No. 4				
Caisson gravity	North 603	9.0	203 m bulk cement handling 400 m public	Needs repairs to deck, and improvement of lighting and water supply
Stone block gravity	South 550	9.0	Public	
Central Wharf				
Caisson and stone block gravity	645	9.0	Public	Needs repairs to deck, and improvement of lighting and water supply

Bukbin Wharf				
Steel sheet pile bulkhead. Two new finger piers, open type construction with reinforced concrete deck on concrete piles, being added.	New finger pier (30 m wide) North Pier North 145 South 135 South Pier North 150 South 140	 7.0 7.0 7.0 7.0	New Coastal Ferry Terminal for public	Improvements added under the First Port Project
New Composite Pier (Pier No. 5)				
Reinforced concrete wharf apron supported on concrete piles; with sheet-piled retaining wall.	Grain berths 336 Container berths 600 Ro/Ro provision 59	12.5 12.5 12.5	Bulk grain handling only Exclusively for containers	Being constructed under the First Port Project
Pier No. 7				
Hydraulic fill behind sheet piled retaining wall wharf. Reinforced concrete deck on concrete piled wharf apron upon which ore, coal and scrap metal handling cranes will be installed. Concrete piled foundations for coal stacker-reclaimer	North berths 245 Two 90 m ores and minerals export berths One 65 m scrap and ore storage area West berths 320 One 135 m coal and ores import berth One 185 m steel billets and scrap import berths	10.0 10.0 	Bulk handling of scrap metal steel billets, coal and mineral ores	Being constructed under the First Port Project

B. Lighter Berths

L/W 1 Gravity wall	160	2.0	Public	Deck needs repairs
L/W 2 Gravity wall	115	2.0	Public and Military	Deck needs repairs
L/W 3 Gravity wall	227	2.0	Military	Fair
L/W 4 Gravity wall	362	2.0	Public	Deck needs repairs
L/W 5 Gravity wall	298	2.0	Coal Corp.	Deck needs repairs. Lighting and water supply needed
L/W 6 Gravity wall	98	2.0	Coal Corp.	Deck needs repairs
L/W 7 Counterfort concrete wall on concrete piles	290	2.0	Public	Deck needs repairs
L/W 8 Gravity wall	502	2.0	KNR and Military	Fair
Custom's L/W Gravity wall	192	2.0	Customs	Good
Bukbin L/W Gravity wall	192	2.0	Military and Passenger	Deck needs repairs
South Harbor Wharf Gravity wall	716	2.0	Public	Good

Source: Bank Staff

November 1976

KOREA

APPRAISAL OF SECOND PORT PROJECT

The Government Budget System

1. Government-owned corporations such as KMPA are given an annual budget grant for expenditure, which is entirely divorced from income. The budget allots ceilings to expenditure under a large number of different headings; these headings are entirely different from those under which the Bank requires expenditure to be reported. For example, the salaries budget is set out in terms of establishment for the District Port Authority concerned, by Civil Service grade, and not in terms of the location and function of the personnel concerned.

2. Cash expenditure is posted to ledger accounts at the head of each of which the budget ceiling is recorded, so that progress against budget can be monitored. There is no cash book as such. The records are generally not kept in a form permitting expenditures at subsidiary ports to be determined without an ad hoc investigation, payment by payment.

3. At the end of the calendar year the books are not closed off; a 20-day period of grace is allowed within which expenditures may still be allocated to the budget of the year concerned. In theory, no doubt, such payments should only cover debts for goods and services which had already been incurred by the year end. Practice may well be different.

4. As with all budget systems where unspent balances are cancelled, there is a premium on getting the full amount spent if possible. Consumable stores are an excellent object for such expenditure, particularly if no stores records are kept and no stocks brought into account at the year end. Under the Korean system, it may or may not be possible to pay during the "period of grace" for items which should properly be chargeable to the budget of the following year; this will depend on the thoroughness of the Government auditors.

5. There are, no doubt, occasions when budget allocations may be fully spent, e.g., maintenance of buildings, and the system is too inflexible to permit switching of underspent allocations from other sections to permit maintenance work to continue or payments to be made until the following budget year.

6. In KMPA financial reports, the absence of any accounts payable (except for a grossly understated item for interest and commitment charges) may perhaps be explained by the clearing of outstandings during the period of grace. At Busan, however, an analysis of contractors' and consultants'

invoices paid in the quarter following the 1975 year end (i.e., out of the 1976 capital budget) produced outstandings of nearly half a million Won. The absence of any value for consumable stores at the year end is also a matter which calls for examination.

7. KMPA is expected to engage a qualified Korean professional accountant to analyze all payments for the 1975 budget from December 1, up to the end of the period of grace, and also at least the first two months of payments from the 1976 budget.

8. Pending the implementation of a commercial accounting system, the accountant would also set up a proper dual analysis system for cash payments. The books of account would be so constituted that invoices are automatically analyzed as they are paid, or when received, under the following headings:

(i) by Government budget heading;

(ii) by headings required for Bank reporting purposes, distinguishing between project ports, secondary ports, and navigational aids not directly related to either;

(iii) by the Bank accounting periods to which they relate; and

(iv) by the nature of the payments, consumable stores being separately noted so that at the end of an accounting period purchases can be scrutinized and enquiries made regarding any substantial quantities likely still to be in stock.

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APPRAISAL OF SECOND PORT PROJECT

KMPA Pro-Forma Special Account

I. Profit and Loss Account

Revenues

1. Operating Revenues

- Port dues
- Dockage
- Anchorage
- Wharfage
- Storage charges
- Tuggage
- Charge for equipment utilization

2. Non-Operating Revenues

- License fees
- Administration fees
- Concession fees from TOCs
- Interest
- Sales of discarded non-capital items

TOTAL

Expenditures

1. Operating Expenditures

- Maintenance of port facilities
- Electricity and other utilities
- Maintenance of equipment and vessels
- Transportation expenses
- General Administration
- Training and research

2. Other Expenditures

- Depreciation costs
- Interest
- Contingencies
- Miscellaneous expenses

3. Net Profit

TOTAL

II. Capital Account

Revenues

- Surplus
- Sale of Fixed Assets
- Sale of Current Assets
- Medium and long-term government loans
- Foreign loans
- Inventory sales
- Depreciation reserve
- Transfer from the Government's Account

TOTAL

Expenditures

- Port construction (work in progress)
- Acquisition of movable assets
- Acquisition of fixed assets
- Purchase of current assets
- Repayment of medium and long-term government loans
- Repayment of foreign loans
- Inventory purchases
- Research and development
- Contingencies

TOTAL

ANNEX 4

ANNEX 5

KOREA

APPRAISAL OF SECOND PORT PROJECT

Terminal Operating Company (TOC) Contract

1. Busan District Port Authority (BPDA) should contract, on terms satisfactory to the Borrower and the Bank, with a single terminal operating company (TOC) for the management of container-handling operations at the composite pier for a suitable period. 1/

2. The contract should govern, inter-alia:

(a) charges to made by KMPA for the use of port facilities and equipment;

(b) the tariff of charges to be made by the TOC for its various services, including a uniform charge for each 20 ft equivalent container unit;

(c) the facilities and equipment to be provided by KMPA;

(d) responsibility for operating the terminal in an efficient manner for use by all KMPA's customers and for handling ships according to the directions of KMPA;

(e) responsibility for maintenance of container and cargo handling equipment, including an agreed annual maintenance budget; and

(f) the right of KMPA periodically to review the TOC's operating costs and adjust the KMPA and TOC charges accordingly.

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1/ The period should not in the first instance exceed the period required to enable BDPA to obtain sufficient experience to enable it to take direct control of the TOC's operations.

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APPRAISAL OF SECOND PORT PROJECT

Project Details

A. Dredging (Map No. 10382R3)

1. The dredging to be undertaken is to provide access to the proposed extension of the container berths provided under the First Port Project. Under the First Port Project, a channel and turning basin is being dredged to the container berths at the Composite Pier with a depth of 12.5 m. 1/ The proposed dredging will extend the turning space and alongside depth to service the extension. The quantity to be dredged is estimated to be 1.5 million m^3. Final quantities will be determined following detailed hydrographic and other surveys during the preparation of detailed engineering by consultants.

2. Removal by dredging of a further 243,000 m^3 of unsuitable soil and weak foundation material, from the area behind the face of the extended pier, will also be undertaken. Suitable fill required for full reclamation of the project area, is estimated to be 3.2 million m^3. Final quantities will be determined following detailed soil investigations and other surveys during the preparation of detailed engineering by consultants.

3. Dredged material will be disposed of at selected dumping areas in deep water some 10 km out to sea.

B. Container Berths Extension (Map No. 12506)

4. The reclaimed area will total some 350,000 m^2, of which the wharf apron will comprise 15,000 m^2. There will be 700 m of container ship berths with 12.5 m water depth alongside, which will cater for the following types of container vessels:

1/ All water depths given are below LWOST.

Type of Ship	Feeder Services (200 TEU /a)	Feeder Services (600 TEU)	Liner Services (1000 TEU)	Liner Services (2000 TEU)
Length) in meters	90	180	210	265
Draft)	6	9	10	12
No. of Ship Berths /b (allowing 25 m clearance between ships)	6	3	2+ /c	2

/a TEU = Twenty-foot Equivalent Units

/b The maximum number of ships of each size which could be berthed simultaneously. In practice, some combination of the various size groups is likely.

/c = 2 Liners plus 1 Feeder Service Vessel.

5. The proposed wharf extension will be similar in construction to that under the First Port Project, and will consist of a reinforced concrete open wharf apron 22 m wide, supported on precast concrete piles. A stone faced retaining dike placed behind the wharf apron, together with precast prestressed sheet piles, will contain the fill. Selected fill material will be consolidated for the landward reclamation. Detailed soil borings over the project area will provide the necessary criteria for final design and detailed engineering. The extent of special drainage techniques required, together with surcharging, to ensure uniform and adequate consolidation for container storage will be determined following this work. Any surplus fill from surcharging will be removed to a triangular area north of the extension behind a sea wall, providing additional unsurfaced land for future use. The work will be undertaken by competent engineering consultants to be appointed by the Government and agreed to by the Bank.

6. The proposed wharf extension will create a rectangular water area at the mouth of a river which enters the harbor at the northeast corner of the proposed works. The Government proposes to dredge a settling basin at this location designed to trap most of the estimated annual 50,000 m^3 of silt, sand and debris entering the harbor area, and reduce the required maintenance dredging. The cost of providing the settling basin is included in the project costs.

7. The reclaimed area will be paved and will have adequate rail tracks and access roads. A container freight station (8,000 m^2) for stuffing and unstuffing containers will be provided together with administration and Customs buildings, ancillary buildings and services.

8. Four 40-ton container gantry cranes will be provided on tracks contiguous with those presently laid under the First Port Project. All the container cranes will therefore be able to move anywhere over the total 1,300 m container berths.

C. Equipment and Floating Craft

9. Container-handling equipment to be procured will be as follows:

(a) 10 transtainers;

(b) 24 tractors and 72 trailers; and

(c) 10 truck scales

10. For the berthing of container ships two tugboats of 3,000 hp capacity will be provided to augment the existing fleet.

D. Rehabilitation Work

11. Rehabilitation works are proposed on Piers 3 and 4, the central wharf and lighter wharf No. 5. They consist largely of paving improvements, installation of electric lighting and water supply. When the new military pier (Pier 8), currently being built by the Government, is completed, the sections of Pier 3, the central wharf and Pier 4 presently in military use will be relinquished to BDMPA.

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ANNEX 7

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Traffic Forecast

1. Available statistics of cargo movements through Busan port provide an unsatisfactory basis for projections. This is particularly true for movements of general cargo, the key commodity from the point of view of the proposed project. For example, inbound general cargo in 1974 rose 56% above 1973 to 3.5 million revenue tons, and outbound, at 3.8 million tons, was 52% higher (Table 6). In 1975, on the other hand, inbound general cargo fell 18% to 2.9 million tons while outbound rose a further 14% to 4.3 million tons. The average annual growth rate in the period 1973-76 was 14% for inbound general cargo and 28% for outbound general cargo.

2. Unidentified general cargo (designated "other general cargo" in Table 6) is forecast to grow from 2.1 million tons inbound in 1977 to 4.2 million tons in 1986, an 8% annual growth, which is in line with GNP growth; and from 3.7 million tons outbound in 1977 to 4.9 million tons in 1986, a 3% annual growth. The discrepancy between this 3% growth and the 11% overall annual growth in exports is explained largely by the fact that the greater part of the expected growth in exports will be handled at ports other than Busan.

3. The principal identified types of general cargo are textiles, machinery and metal products, and plywood. Inbound and outbound textiles are forecast to increase at about 5% p. a., while machinery and metal products are projected at about 3% p.a. inbound and about 12% outbound. The latter figure reflects the development of export-oriented industry in southeast Korea, particularly at the large industrial complex of Changweon. Plywood exports are expected to reach about one million tons p.a. by 1979 and remain fairly stable thereafter, as a result of growing competition in world markets from timber-producing countries.

4. Other identified types of general cargo are fertilizer, wood pulp and dry chemicals. Fertilizer imports are expected to be phased out by 1980 as a result of growing domestic production. Wood pulp imports are expected to decline between 1978 and 1984 as a result of the start-up of a chemical wood pulp plant at Onsan in 1978. Similarly, imports of dry chemicals are expected to increase only slowly through 1981, and then to decline as a result of increasing domestic production.

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ANNEX 8

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APPRAISAL OF SECOND PORT PROJECT

Valuation of Existing Assets

1. A KMPA working party revalued the existing assets at Busan as at December 31, 1974 on the basis of the then current land values and construction costs with appropriate allowances for age and condition. The valuations appear to be reasonable, and have been accepted pending a report by professional accountants.

Depreciation

2. The current depreciation charges on the existing port assets are probably too low owing to the application by KMPA accountants of invalid principles in making the necessary calculations. The Bank has requested that the basis of the charges should be investigated by Korean professional accountants, but the KMPA figures have been used for the purposes of the present financial estimates. When the First Port Project is completed in 1978 the charges for depreciation of the assets now in use will be dwarfed by depreciation charges on the new ones, and it would make little difference to the estimates if present charges were increased by 50% or even doubled.

3. Depreciation charges on the new assets in the First and Second Port Projects have been based on the following amortization rates:

Civil works on piers and wharves	3% p.a. on cost
Bulk handling equipment	10% p.a. on cost
Container-handling equipment	10% p.a. on cost
Container chassis	15% p.a. on cost
Tugboats	5% p.a. on cost
Pier No. 3 (transferred from military use)	5% p.a. on cost estimated value in 1978.

4. The rate of 3% used for the civil works is a composite one based on 2 1/2% for the main structure and higher rates for items such as paving and sheds with shorter lives than the piers and wharves themselves.

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APPRAISAL OF SECOND PORT PROJECT

Assumptions Used in Financial Forecasts

General

1. It has been assumed that KMPA's financial autonomy under Law 928 will be increased on January 1, 1979, and that the equity of the BDMPA will be held by it on behalf of the Government.

2. It has further been assumed that the Government will provide KMPA with cash resources sufficient to enable it to make cash grants to BDMPA equal to its cash deficit in 1977 and 1978. These grants, which include adequate cash working capital as at January 1, 1979, are treated as equity contributions to BDMPA.

3. In the estimates, BDMPA cash funds are shown as accumulating from year to year; the disposal of the cash funds in practice will be a policy matter to be decided by KMPA from time to time in the light of the needs of the Authority as a whole and any eventual requirement for the payment of dividend or interest on Government-owned capital.

Transfer of Assets from Work in Progress

4. It has been assumed that assets covered by the First and Second Port Projects will come into use as shown below; the estimated book costs of the relevant assets have been transferred from work in progress to "other fixed assets" accordingly.

First Port Project	Date of First Use
Pier No. 1	January 1, 1978
Coastal Ferry	January 1, 1978
Composite Pier	January 1, 1978
Pier No. 2	July 1, 1978
Pier No. 7	July 1, 1978
Second Port Project	
Tugboats	July 1, 1978
Rehabilitation of Pier 1	July 1, 1980
Container Terminal and Steel Scrap Wharves	January 1, 1981

Government-owned Assets

5. It has been assumed that Pier No. 3 (at present in military use by the Government pending completion of a new military wharf) will be transferred to BDMPA on January 1, 1978. This pier was valued at Won 2,930 million in 1972: its value at date of transfer is taken as Won 6,000 million in the light of movements in the IMF consumer prices index for Korea up to the end of 1975 and the rates of inflation assumed throughout the estimates from 1975 onward. The sum in question was credited to the Government's equity in BDMPA.

Monetary Inflation

6. It has been assumed throughout the estimates that the local currency price in Won of goods in general will increase according to the scale shown below:

Year	Price Increase	Price Index (1976 = 100)
1977	12%	112
1978	12%	125
1979	12%	140
1980	10%	154
1981	10%	170
1982	10%	187
1983	10%	207

Loans from IBRD and Saudi Fund for Development

7. It has been assumed that for accounting purposes disbursements from the IBRD and Saudi Funds loans made for Busan assets or consultancy services financed under the First or Second Port projects are liabilities of BDMPA subject to the same terms as those applicable to the Government. Disbursements for general consultancy services concerning all KMPA ports have been excluded as being a direct liability of KMPA Headquarters, as have disbursements for assets and services connected with Mugho.

Revenue Forecasts

8. The revenue forecasts for 1976 are based on the cash revenues received during the first nine months and the increase in port traffic expected during the last quarter; port charges were increased in November 1975, and again in March 1977. Forecasts for the years 1978-82 inclusive are based on expected volumes of shipping and cargo passing through the ports and 1977 tariffs, increased by an overall 15% on July 1, 1978, and a further 20% on July 1, 1981, to offset cost increases arising from price inflation. Ship-based tariffs were applied to estimates of Gross Registered Tonnage (GRT) made in the light of the traffic recorded through the port in 1973, 1974 and 1975,

and of the cash revenues from ship charges in 1976. Cargo-based revenues were based on the forecast volumes of cargoes of various types, and the port tariffs currently in force. The revenues from tuggage and the use of cranes, which are time-based, were assumed to increase in proportion to the GRT of shipping using the port, as were miscellaneous revenues.

9. In order to forecast cash receipts for port revenues, estimates had to be made of the charges due but uncollected at each year-end. KMPA has agreed to have this matter investigated by a qualified accountant since no accruals are at present made and no factual basis for making estimates is available. The conservative assumption was made for purposes of the present forecasts that 3 1/2 days revenue is outstanding on transit shed and open cargo area charges, 3 days on dockage, 1 1/2 days on other ship-based dues, and 1/2 day on wharfage. Applied to the detailed revenue estimates for 1976 and 1985, these assumptions gave outstandings in each case of 1/2 of 1% of annual revenue; this percentage was thereafter used throughout in estimating revenue outstandings. Year end accruals in respect of charges against TOC's are assumed to approximate to one month's revenue.

10. To enable BDMPA to achieve a reasonable rate of return on the use of the assets provided by the projects, it has been assumed that a charge against TOCs will be levied on July 1, 1978, equivalent to US$58 per container, rising to US$68 on July 1, 1981. This charge is sufficient to recoup BDMPA's asset maintenance, depreciation and interest charges and provide an adequate return on the assets in use. In practice, the charge will be imposed selectively with regard to the cost of wharf facilities and mechanical equipment used for each type of cargo, i.e., bulk, containers and break bulk.

11. The revenue estimates presented in the Profit and Loss Accounts (Table 9) therefore, set out the additional revenues required to bring in an adequate cash flow without further Government assistance beyond 1978, and to provide adequate coverage of the debt service and repayments from net revenues, realistic depreciation charges, and an overall net operating return of at least 7% p.a. on net fixed assets in use from January 1, 1978 onwards.

Operating Costs

12. In estimating annual operating costs for the years 1977-82, separate estimates were made at 1976 prices for the labor content and for brought-in supplies and services. The resulting estimates were then increased by applying separate factors for the expected development of wage rates and general prices respectively.

13. The general price indices used provide for a 12% increase in Won prices in 1977 over 1976; 12% increases in 1978 and 1979; and increases at the rate of 10% p.a., thereafter.

14. Wage rate indices were constructed by assuming a general increase in real wages at a rate of 4 1/2% p.a., (a rate which compares with an average annual rate of increase of 4.9% between the first quarters of 1972 and

1975 according to statistics for South Korea published by the IMF). Because KMPA staff wages and salaries are based on the scales applying to Government employees, they are very low by comparison with those current in private employment. It is understood that it is the policy of the Korean Government to close this differential substantially in the course of the next few years. It has been assumed, therefore, that KMPA staff will receive special additions of 7 1/2% p.a. to their wages in each of the years 1977-80 inclusive, over and above the 4 1/2% expected general increase in real wages.

15. It has been assumed that, from 1977 onwards, the provision of navigational aids for the port will be undertaken by KMPA instead of BDMPA.

16. Maintenance costs are at present very low for a port as extensive as Busan. Repairs and rehabilitation were neglected until major reconstruction became necessary. When the new and rehabilitated assets covered by the First Port Project become operational a major increase in maintenance activity will be needed, with a second large increase later when the Second Port Project is completed. An important part of both projects consists of modern bulk-cargo handling and container handling equipment, and it is essential that specialized repair and maintenance services should be set up for the very expensive equipment concerned. It has been assumed that by 1982 a labor force of 130 men will be required on maintenance work, and that at 1975 prices brought-in supplies and services will cost 200% of the wage and salary bill. The resulting overall cost estimates were tested against the rule-of-thumb that good maintenance can cost up to 1 1/2% of the capital cost of civil works and 2 1/2% of the cost of mechanical equipment; by this criterion the cost estimates are still rather low, though they probably represent the maximum effort which will be within the technical and administrative competence of the BDMPA until there has been an extensive training program.

17. Administration costs in real terms will also have to increase very substantially over the next five years if the new port facilities are to be run in an efficient manner. Provision has been made in the estimates for a counterpart staff of 75 employees to control the cargo handling activity from 1978 onwards, when the assets in the First Port Project become operational and the present stevedoring companies are merged in a single corporation working under the operational control of the BDMPA. By 1978 the financial and accounting staff will have to be expanded by at least 20 employees. Senior members of the accounting staff will have to be more highly qualified than any at present available if the quality of financial and management accounting is to be raised to an adequate level, and better paid than existing staff. The provision of continuous data and cost accounts by profit center is essential for both efficiency and the establishment of sound cost-based revenue tariffs.

18. It has been assumed in the estimates that from 1980 onward a staff of 20 will be required to man the computer which is planned for container control. Allowance has also been made for successive increases of 10% in the general administrative staff at BDPA Headquarters in 1979 and 1981.

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APPRAISAL OF SECOND PORT PROJECT

Busan Port Capital Investment Program 1976-82
(US$'000)

	Expenditure Prior to 76	1976	1977	1978	1979	1980	1981	1976-81 Total	1982
First Port Project	16,400	43,100	78,300	27,400	2,100	-	-	150,900	-
Second Port Project	-	-	2,000	15,200	23,000	36,300	35,400	111,900	-
Minor Capital Expenditures	-	-	1,000	2,000	1,000	1,000	1,500	6,500	2,000
Total	16,400	43,100	81,300	44,600	26,100	37,300	36,900	269,300	2,000

Source: Bank Staff

March 1977.

TABLE 1

TABLE 2

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APPRAISAL OF SECOND PORT PROJECT

Detailed Project Cost Estimates

	Estimated Costs					
	Won Million			US$'000		
	Local	Foreign	Total	Local	Foreign	Total
A. Civil Works						
1. Container Berth Extension						
(i) Dredging approach to the extended container pier, and disposal of 1.5 million m^3 of dredged material 10 km to sea; and dredging to 12.5 m at the pier face.	486	619	1,105	1,000	1,280	2,280
(ii) 700 m container berth extension; providing an area of 350,000 m^2, complete with paving, drainage, fencing, crane rails, rail sidings, freight station, buildings, ancillary facilities, etc.	8,460	10,350	18,810	17,440	21,340	38,780
Subtotal	8,946	10,969	19,915	18,440	22,620	41,060
2. Rehabilitation Work						
(i) Piers 3 and 4	598	731	1,329	1,230	1,510	2,740
(ii) Central Wharf	216	266	482	450	550	1,000
(iii) Lighter Wharf No. 5	144	176	320	300	360	660
Subtotal	958	1,173	2,131	1,980	2,420	4,400
Total Civil Works	9,904	12,142	22,046	20,420	25,040	45,460
B. Mechanical Equipment and Floating Craft						
1. Container Handling						
(i) 10 truck scales	9	70	79	20	140	160
(ii) 4-40 ton container cranes	345	2,797	3,142	710	5,770	6,480
(iii) 10-40 ton transtainers	369	2,983	3,352	760	6,150	6,910
(iv) tractors and trailers for 20 ft and 40 ft containers	68	560	628	140	1,160	1,300
2. 2-3,000 hp tugboats	263	2,126	2,389	540	4,380	4,920
Total Mechanical Equipment and Floating Craft	1,054	8,536	9,590	2,170	17,600	19,770
C. Engineering Consultant Services						
1. Preparation of detailed engineering work up to award of contracts. (Preparation of detailed designs, specifications, bid documents for all civil works, equipment and floating craft, including inspection services).	339	1,140	1,479	700	2,350	3,050
2. Supervision of civil works construction, floating craft construction, equipment installation and tests after delivery and installation.	242	800	1,042	500	1,650	2,150
Total Engineering Consultant Services	581	1,940	2,521	1,200	4,000	5,200
D. Technical Assistance and Training	150	582	732	310	1,200	1,510
Base Cost Estimate	11,689	23,200	34,889	24,100	47,840	71,940
Physical Contingencies	1,485	1,821	3,306	3,060	3,750	6,810
Price Contingencies	5,060	8,928	13,988	10,435	18,410	28,845
Total	18,234	33,949	52,183	37,595	70,000	107,595
E. Add Customs Duties on "B"	2,100	-	2,100	4,330	-	4,330
PROJECT GRAND TOTALS	20,334	33,949	54,283	41,925	70,000	111,925

Source: Government, Consultants and Bank Staff

March 1977

TABLE 3

KOREA

APPRAISAL OF SECOND PORT PROJECT

Proposed Grouping of Contracts

1. Civil Engineering Contracts

   A. Dredging

   B. Pier 6 - Container Berth Extension - Rough Grading

   C. Pier 6 - Container Berth Extension - Final Works

2. Mechanical Procurement Contract

   - Container Cranes and Container handling equipment[1/]

3. Floating Craft Procurement Contract

   - Tugboats

1/ This contract will be based on the equipment described in the project but bidders will be allowed to propose alternative methods of handling containers in the stacking area.

TABLE 4

KOREA

APPRAISAL OF SECOND PORT PROJECT

Annual Estimated Project Expenditure

Calendar Year	Expenditure in Foreign Currency (US$'000)	Expenditure in Local Currency (Won million)
1977	2,200	340
1978	10,000	2,888
1979	13,400	4,948
1980	24,500	6,054
1981	19,900	6,104
TOTALS	70,000	20,334

Source: Bank Staff

March 1977.

TABLE 5

KOREA

APPRAISAL OF SECOND PORT PROJECT

Estimated Disbursement Schedule
(US$'000)

Bank Fiscal Year	Quarter	Amount Disbursed	Cumulative Annual	Cumulative Total
1977	3	-		
	4	700	700	700
1978	1	750		
	2	750		
	3	1,000		
	4	2,500	5,000	5,700
1979	1	3,200		
	2	3,300		
	3	3,300		
	4	3,300	13,100	18,800
1980	1	3,400		
	2	3,400		
	3	4,500		
	4	6,000	17,300	36,100
1981	1	7,500		
	2	6,500		
	3	6,200		
	4	5,500	25,700	61,800
1982	1	4,800		
	2	400	5,200	67,000

Source: Bank Staff
March 1977.

KOREA

APPRAISAL OF SECOND PORT PROJECT

TABLE 6

Busan Port Traffic - 1973-82
('000 Revenue Tons)

	Actual			Est.	Projections									
	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
INBOUND														
Grain	1,085	702	977	1,002	1,042	1,084	1,127	1,172	1,219	1,268	1,318	1,371	1,426	1,483
Iron, Steel & Scrap	1,040	869	910	1,358	1,345	1,332	1,319	1,305	1,292	1,324	1,357	1,391	1,426	1,461
Coal	425	714	925	978	1,030	1,084	1,142	1,202	1,266	1,306	1,348	1,391	1,436	1,482
Timber 1/	1,965	1,397	2,120	2,313	2,406	2,502	2,602	2,706	2,814	2,828	2,842	2,856	2,871	2,885
Cement	590	702	1,137	1,131	1,236	1,351	1,477	1,614	1,764	1,866	1,975	2,089	2,210	2,338
Other Dry Bulk	137	140	125	103	95	87	80	80	80	80	80	80	80	80
Total Dry Bulk	5,242	4,524	6,194	6,886	7,154	7,440	7,747	8,079	8,435	8,672	8,920	9,178	9,449	9,729
Crude Petroleum 2/	250	377	297	234	250	268	287	307	328	351	376	402	430	460
Petroleum Products 2/	1,853	1,795	1,555	2,119	2,373	2,658	2,977	3,334	3,734	4,183	4,684	5,247	5,876	6,581
Other Bulk Liquids	154	246	213	179	207	234	260	287	315	327	339	351	363	455
Total Bulk Liquids	2,257	2,418	2,065	2,532	2,830	3,160	3,524	3,928	4,377	4,861	5,399	6,000	6,669	7,496
Fertilizer	-	51	165	42	32	24	16	8	-	-	-	-	-	-
Wood Pulp	160	146	173	199	179	159	139	119	100	110	125	135	145	160
Textiles	200	180	208	235	248	261	273	286	299	314	330	345	360	375
Machinery and Metal Products	285	227	281	334	347	359	372	384	397	409	420	430	445	460
Dry Chemicals	348	258	258	257	260	262	265	267	270	250	230	210	190	165
Other General Cargo	1,283	2,681	1,820	1,956	2,112	2,281	2,464	2,661	2,874	3,104	3,352	3,620	3,910	4,223
Total General Cargo	2,276	3,543	2,905	3,023	3,178	3,346	3,529	3,725	3,940	4,187	4,457	4,740	5,050	5,383
TOTAL IMPORTS	9,775	10,485	11,164	12,441	13,162	13,946	14,800	15,732	16,752	17,720	18,776	19,920	21,168	22,608
Percentage of General Cargo Containerized	23.4%	30.5%	36.8%	43.8%	45.0%	47.0%	50.0%	52.0%	54.0%	56.0%	58.0%	60.0%	60.0%	60.0%
Containerized General Cargo ('000 tons)	533	1,080	1,068	1,323	1,430	1,573	1,765	1,937	2,128	2,345	2,585	2,844	3,030	3,230
Tons per Container	n.a.	18.0	18.9	19.1	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Number of Containers (Full)	n.a.	59,932	56,544	69,234	75,263	82,769	92,895	101,947	112,000	123,421	136,053	149,684	159,474	170,000
Number of Containers (Empty)	n.a.	23,000	25,739	38,766	36,884	33,610	33,834	35,657	37,016	37,303	36,894	35,929	32,078	27,579
TOTAL CONTAINERS	45,095	82,932	82,283	108,000	112,147	116,379	126,729	137,604	149,016	160,724	172,947	185,613	191,552	197,579
OUTBOUND														
Cement	365	380	558	621	579	200	200	200	200	200	200	200	200	200
Ores and Minerals	255	341	358	318	328	337	347	358	369	380	391	403	415	427
Scrap Metal and Steel	375	467	425	579	616	655	697	742	790	781	773	764	756	747
Other Dry Bulk	8	4	1	-	-	-	-	-	-	-	-	-	-	-
Total Dry Bulk	1,003	1,192	1,342	1,518	1,523	1,192	1,244	1,300	1,359	1,361	1,364	1,367	1,371	1,374
Petroleum Products 2/	50	52	18	15	10	5	-	-	-	-	-	-	-	-
Total Liquid Bulk	50	52	18	15	10	5	-	-	-	-	-	-	-	-
Plywood	645	442	656	948	967	986	1,006	1,026	1,047	1,050	1,050	1,050	1,050	1,050
Textiles	265	249	279	309	327	345	364	382	400	422	445	467	490	512
Metal Products and Machinery	150	185	210	234	285	336	387	438	489	545	601	655	711	767
Other General Cargo	1,437	2,918	3,190	3,639	3,748	3,861	3,976	4,096	4,219	4,345	4,476	4,610	4,748	4,891
Total General Cargo	2,497	3,794	4,335	5,130	5,327	5,528	5,733	5,942	6,155	6,362	6,572	6,782	6,999	7,220
TOTAL OUTBOUND	3,550	5,038	5,695	6,663	6,860	6,725	6,977	7,242	7,514	7,723	7,936	8,149	8,370	8,594
Percentage of General Cargo Containerized	16.4%	45.5%	38.4%	40.0%	40.0%	40.0%	42.0%	44.0%	46.0%	48.0%	50.0%	52.0%	52.0%	52.0%
Containerized General Cargo ('000 tons)	409	1,725	1,665	2,052	2,131	2,211	2,408	2,614	2,831	3,054	3,286	3,527	3,639	3,754
Revenue Tons per Container	n.a.	21.8	18.3	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Number of Containers (Full)	n.a.	72,118	88,509	108,000	112,147	116,379	126,729	137,604	149,016	160,724	172,947	185,613	191,552	197,579
Number of Containers (Empty)	n.a.	7,000	2,336	-	-	-	-	-	-	-	-	-	-	-
TOTAL CONTAINERS	37,110	79,118	90,845	108,000	112,147	116,379	126,729	137,604	149,016	160,725	172,947	185,613	191,552	197,579

1/ Handled in the stream
2/ Handled over private port facilities

Source: KMPA
Trans-Asia Group
Bank Staff

August 1976

KOREA

APPRAISAL OF SECOND PORT PROJECT

Economic Costs and Benefits
(US$'000)

Year	Economic Cost	Economic Benefits: Ship Waiting Time 1/	Container Yard Cost Eliminated 2/	Transport Cost On Incheon Containers 3/	Total
1977	1,300				
1978	9,900				
1979	14,800				
1980	23,500				
1981	19,700	1,278	4,292	1,818	7,388
1982		1,666	4,629	1,961	8,256
1983		2,328	4,981	2,110	9,419
1984		3,490	5,346	2,264	11,100
1985		9,716	5,517	2,337	17,570
1986		10,000	5,690	2,410	18,100
1987		10,000	5,861	2,482	18,343
1988		10,000	6,036	2,557	18,593
1989		10,000	6,218	2,633	18,851
1990		10,000	6,404	2,712	19,116
1991		10,000	6,596	2,794	19,390
1992		10,000	6,794	2,878	19,672
1993		10,000	6,998	2,964	19,962
1994		10,000	7,208	3,053	20,261
1995		10,000	7,424	3,145	20,569
1996		10,000	7,647	3,239	20,886
1997		10,000	7,876	3,336	21,212
1998		10,000	8,112	3,436	21,548
1999		10,000	8,356	3,539	21,895
2000		10,000	8,607	3,645	22,252
Total Economic Cost		69,200		Return	17%

Items Omitted
- Price Contingencies 28,800
- Taxes and Duty 12,400
- Technical Assistance 1,500

Total Project Cost 111,900

1/ Taken at US$3,500 per ship-day.
2/ Cost of transporting containers to container yards and double-handling. Taken at US$48 per container.
3/ Additional cost of transport on Seoul containers routed via Incheon. Taken at US$12.20 per container.

Source: Bank Staff
March 1977

TABLE 7

TABLE 8

KOREA

APPRAISAL OF SECOND PORT PROJECT

Port of Busan - Cash Revenue and Expenditure 1973-75
(Won Millions)

		1973	1974	1975
1.	Operating Revenues (Cash Basis)			
	Port Dues	373	289	240
	Anchorage	-	-	42
	Light Dues	106	82	71
	Tuggage	191	228	216
	Dockage	172	553	653
	Wharfage	-	551	700
	Transit Shed Charges	81	83	50
	Open Cargo Area Charges	119	118	132
	Floating Cranes	45	39	41
	Rental of Facilities	41	6	6
	Water Supply	2	2	2
	Miscellaneous Revenue	73	56	75
	Total Operating Revenues	1,203	2,007	2,228
2.	Operating Expenses (Cash Basis)			
	Navigational Aids	14	151	186
	Maintenance	139	212	160
	Port Administration & Miscellaneous	163	128	156
		316	491	502
	Depreciation	640	519	433
	Total Operating Expenses	956	1,010	935
3.	Net Operating Cash Revenue	247	997	1,293
	Interest & Commitment Charges (Accrued Basis)	144	334	394
	Net Income	103	663	899
	Operating Ratio	79	50	42
	Operating Return on Average Net Fixed Assets In Use	4.5%	4.7%	6.0%

Source: Bank Staff
October 1976

KOREA

APPRAISAL OF SECOND PORT PROJECT

Port of Busan - Profit and Loss Account 1975-82
(Won Millions)

	(Actual) 1975	(Est) 1976	1977	(Forecast) 1978	1979	1980	1981	1982
Operating Revenues								
Port Dues	240	555	672	738	782	829	886	930
Anchorage	42	674	818	880	915	952	1,000	1,040
Light Dues	71	-	-	-	-	-	-	-
Tuggage	216	220	254	279	295	310	331	348
Dockage	653	716	993	1,074	1,117	1,173	1,231	1,292
Wharfage	700	1,218	1,474	1,585	1,680	1,764	1,870	1,982
Transit Sheds	50	50	52	54	57	60	65	68
Open Cargo Areas	132	180	189	196	210	220	233	245
Floating Cranes	41	50	60	63	67	71	75	79
Rental of Facilities	6	30	30	30	30	30	30	30
Water Supplies	2	6	7	8	8	9	9	10
Sundry Income	75	150	159	168	178	188	200	210
Total Operating Revenues	2,228	3,849	4,708	5,075	5,339	5,606	5,930	6,234
Tariff Increases:								
assuming overall 15% July 1, 1978 and 20% July 1,1981				380	801	841	1,572	2,369
Revenue from Terminal Operating Companies				3,274	7,130	7,741	9,106	10,601
Total Operating Revenues	2,228	3,849	4,708	8,729	13,270	14,188	16,608	19,204
Operating Expenses								
Navigational Aids	186	-	-	-	-	-	-	-
Maintenance	160	224	240	531	664	885	996	1,040
Port Administration	156	162	193	319	337	368	387	387
Total Working Expenses	502	386	433	850	1,001	1,253	1,383	1,427
Add Allowances for Price Inflation	-	-	52	212	400	677	968	1,241
Adjusted Total Working Expenses	502	386	485	1,062	1,401	1,930	2,351	2,668
Depreciation	433	443	448	2,957	4,492	4,849	5,225	5,930
Total Operating Expenses	935	829	933	4,019	5,893	6,779	7,576	8,598
Net Operating Revenue	1,293	3,020	3,775	4,710	7,377	7,409	9,032	10,606
Interest and Commitment Charges - Long Term Debt	394	832	2,056	3,158	3,775	4,363	4,740	4,559
Net Income	899	2,188	1,719	1,552	3,602	3,046	4,292	6,047
Ratios								
Operating Ratio	42	21	20	46	44	48	46	45
Times Interest Earned	3.3	3.6	1.8	1.5	1.9	1.7	1.9	2.3
Debts Service Coverage	4.4	4.1	2.0	2.1	2.6	1.9	1.5	1.8
Rate of Return on Average Net Fixed Assets in Use	6.1	14.4	18.2	7.8	7.6	7.7	7.8	7.9

Source: Busan Port and Bank Staff
March 1977.

KOREA

APPRAISAL OF SECOND PORT PROJECT

Port of Busan - Balance Sheet at December 31, 1975-82
(Won millions)

	(Actual)	(Est.)	(Forecast)					
	1975	1976	1977	1978	1979	1980	1981	1982
ASSETS								
Current Assets								
Cash	nil	nil	nil	1,600	3,329	2,806	3,383	4,533
Accounts Receivable	11	18	37	656	674	694	912	930
Stores	nil	11	13	31	43	58	74	82
Total Current Assets	11	29	50	2,287	4,046	3,558	4,369	5,545
Fixed Assets								
Gross Value Land (as revalued Dec. 12, 1974)	7,916	7,916	7,916	7,916	7,916	7,916	7,916	7,916
Gross Value Other Fixed Assets (at valuation Dec. 31, 1974 plus additional at cost)	13,676	13,676	14,161	95,347	96,414	100,613	146,078	151,048
Accumulated Depreciation	433	876	1,324	4,281	8,773	13,622	18,847	24,777
Net Value Other Assets in Use	13,243	12,800	12,837	91,066	87,641	86,991	127,231	126,271
Total Net Fixed Assets in Use	21,159	20,716	20,753	98,982	95,557	94,907	135,147	134,187
Work-in-Progress	11,758	28,675	60,021	4,869	17,001	29,918	-	-
Total Fixed Assets	32,917	49,391	80,774	103,851	112,558	124,825	135,147	134,187
TOTAL ASSETS	32,928	49,420	80,824	106,138	116,604	128,383	139,516	139,732
LIABILITIES AND EQUITY								
Current Liabilities								
Accounts Payable: Capital Goods	464	1,257	2,181	1,017	1,270	1,983	2,423	81
Port Operations	-	15	16	32	42	56	69	78
Interest on Loans	227	524	1,185	1,680	1,951	2,266	2,407	2,309
Total Current Liabilities	691	1,796	3,382	2,729	3,263	4,305	4,899	2,468
Loans Outstanding								
IBRD-First Port Project	3,895	11,680	26,176	32,684	32,636	31,752	30,802	29,784
IBRD-Second Port Project	-	-	627	4,180	10,493	20,204	28,538	27,293
Saudi Fund for Development-First Port Project	-	2,431	10,160	13,838	13,903	12,767	11,630	10,493
Total Loans	3,895	14,111	36,963	50,702	57,032	64,723	70,970	67,570
Equity								
Capital at January 1, 1975	22,936	22,936	22,936	22,936	22,936	22,936	22,936	22,936
Accumulated Retained Earnings	899	3,087	4,806	6,358	9,960	13,006	17,298	23,345
Accumulated Government Cash Grants	4,507	7,490	12,737	17,413	17,413	17,413	17,413	17,413
Assets brought in by Government				6,000	6,000	6,000	6,000	6,000
Total Equity at End of Year	28,342	33,513	40,479	52,707	56,309	59,355	63,647	69,694
TOTAL LIABILITIES AND EQUITY	32,928	49,420	80,824	106,138	116,604	128,383	139,516	139,732
Current/Liquid Ratio 1/	N/A	N/A	N/A	1.1	1.6	1.2	1.3	2.2
Debt/Equity Ratio	12/88	30/70	48/52	49/51	50/50	52/48	53/47	49/51

1/ Excluding 63% of capital goods accounts payable, this proportion being payable from loan funds.

Source: Busan Port and Bank Staff

March 1977

KOREA

APPRAISAL OF SECOND PORT PROJECT

Port of Busan - Cash Flows for the Years 1975-1982
(Won Millions)

	Actual 1975	(Est.) 1976	Forecast 1977	1978	1979	1980	1981	1982	Total 1975-82
I. Cash Requirements									
1. Capital Investments									
(i) First Port Project	9,403	18,917	31,380	10,670	582	-	-	-	70,952
(ii) Second Port Project	-	-	966	7,394	11,132	17,631	13,820	3,000	53,943
(iii) Other	345	-	485	970	485	485	727	970	4,467
Total Investments	9,748	18,917	32,831	19,034	12,199	18,116	14,547	3,970	129,362
2. Debt Service									
(i) Interest and Commitment Charges	394	832	2,056	3,158	3,775	4,363	4,740	4,559	23,877
(ii) Repayments	-	-	-	390	821	2,020	4,490	4,560	12,281
Total Debt Service	394	832	2,056	3,548	4,596	6,383	9,230	9,119	36,158
3. Increase in Working Capital (Decrease)	(680)	(3,087)	(2,565)	2,290	496	(2,007)	640	3,457	(1,456)
4. Total Cash Required	9,462	16,662	32,322	24,872	17,291	22,492	24,417	16,546	164,064
II. Cash Available									
1. Internally Generated:									
(i) Net Operating Revenue	1,293	3,020	3,775	4,710	7,377	7,409	9,032	10,606	47,222
(ii) Depreciation	433	443	448	2,957	4,492	4,849	5,225	5,930	24,777
Total	1,726	3,463	4,223	7,667	11,869	12,258	14,257	16,536	71,999
2. Government Grants: (Deficit on Cash Account)	4,507	2,983	5,247	4,676	-	-	-	-	17,413
3. Loans:									
(i) IBRD	3,229	7,785	15,123	10,451	7,086	9,711	10,737	1,160	65,282
(ii) Saudi Fund for Development	-	2,431	7,729	3,678	65	-	-	-	13,903
Total Loans	3,229	10,216	22,852	14,129	7,151	9,711	10,737	1,160	79,185
4. Cash at Beginning of Year	nil	nil	nil	nil	1,600	3,329	2,806	3,383	-
5. Total Cash Available	9,462	16,662	32,322	26,472	20,620	25,298	27,800	21,079	168,597
6. Cash at End of Year	nil	nil	nil	1,600	3,329	2,806	3,383	4,533	4,533
7. Increase (decrease) in Cash During Period	nil	nil	nil	1,600	1,729	(523)	577	1,150	-

Source: Bank Staff
March 1977.

TABLE 12

KOREA

APPRAISAL OF SECOND PORT PROJECT

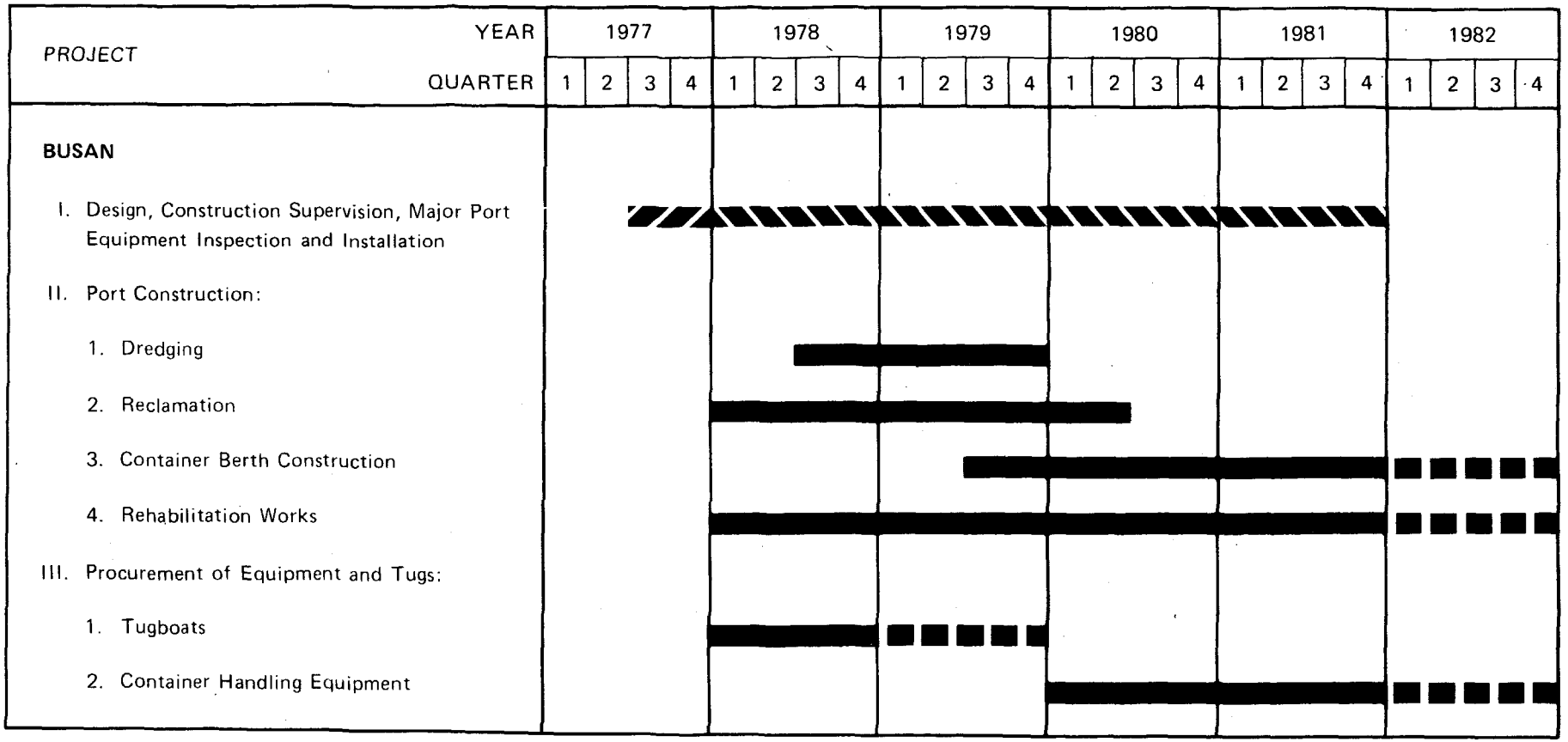
Summary Cash Flow Data; Financial Plan 1975-82
(Won Millions)

			%
Capital Investments		129,362	100
Internally Generated Cash		71,999	
Less Debt Service	36,158		
Increase of Working Capital	3,077	39,235	
Internal Cash - Available for Port Investment		32,764	25
Loans		79,185	61
Government Grants		17,413	14
		129,362	100

Source: Bank Staff

March 1977.

KOREA
SECOND PORT PROJECT
Design and Construction Schedule



LEGEND:

Engineering Services: Detailed Engineering, Design, and Services to Contract Award Stage

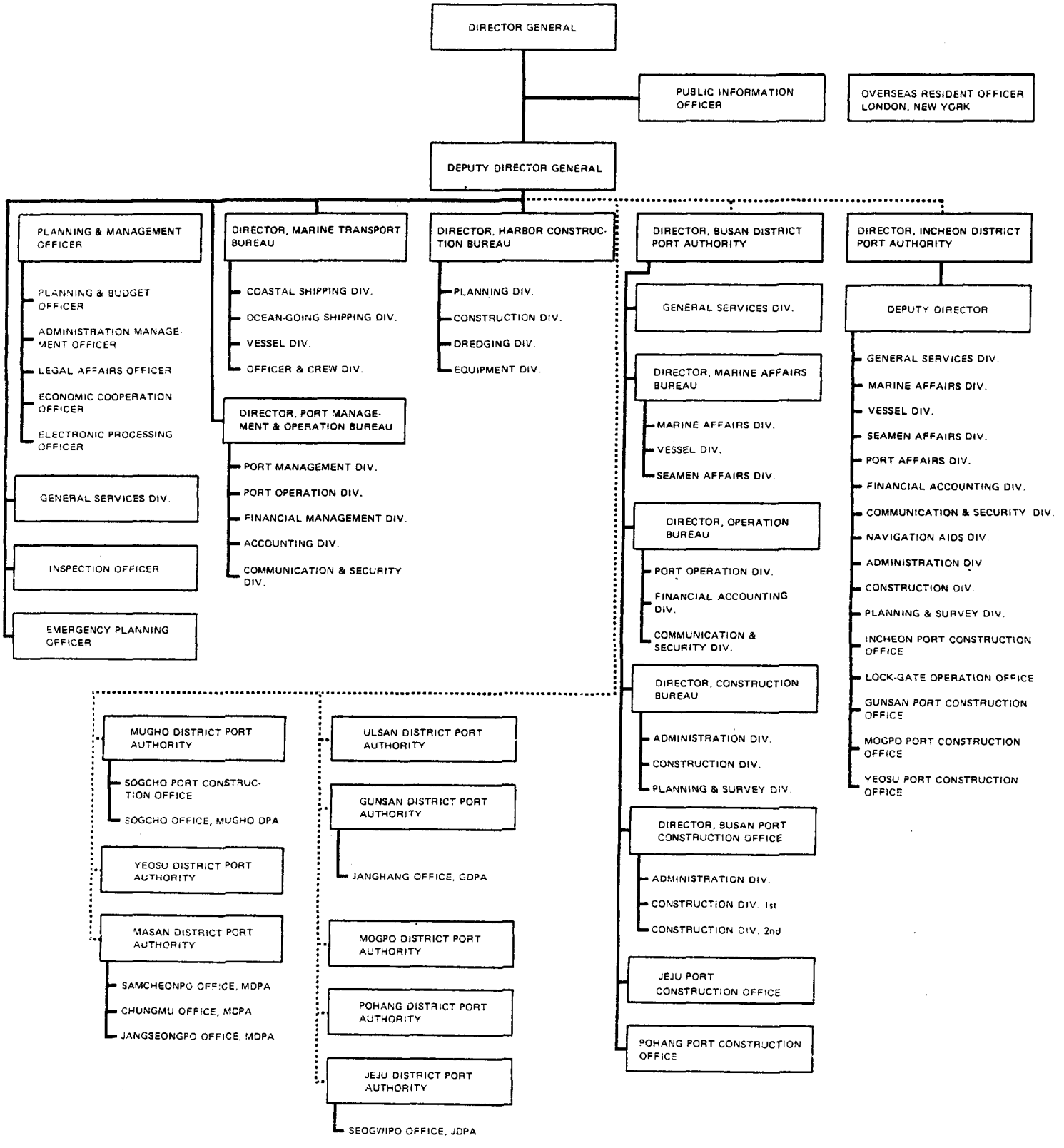
Engineering Services: Construction Supervision and Equipment Inspection Services Until Completion of the Project

Construction Period and Period for Procurement and Installation of Equipment and Tugboats

Guarantee Period (Period to make good defective work)

World Bank--16510

KOREA
APPRAISAL OF SECOND PORT PROJECT
KOREA MARITIME AND PORT AUTHORITY
ORGANIZATION CHART

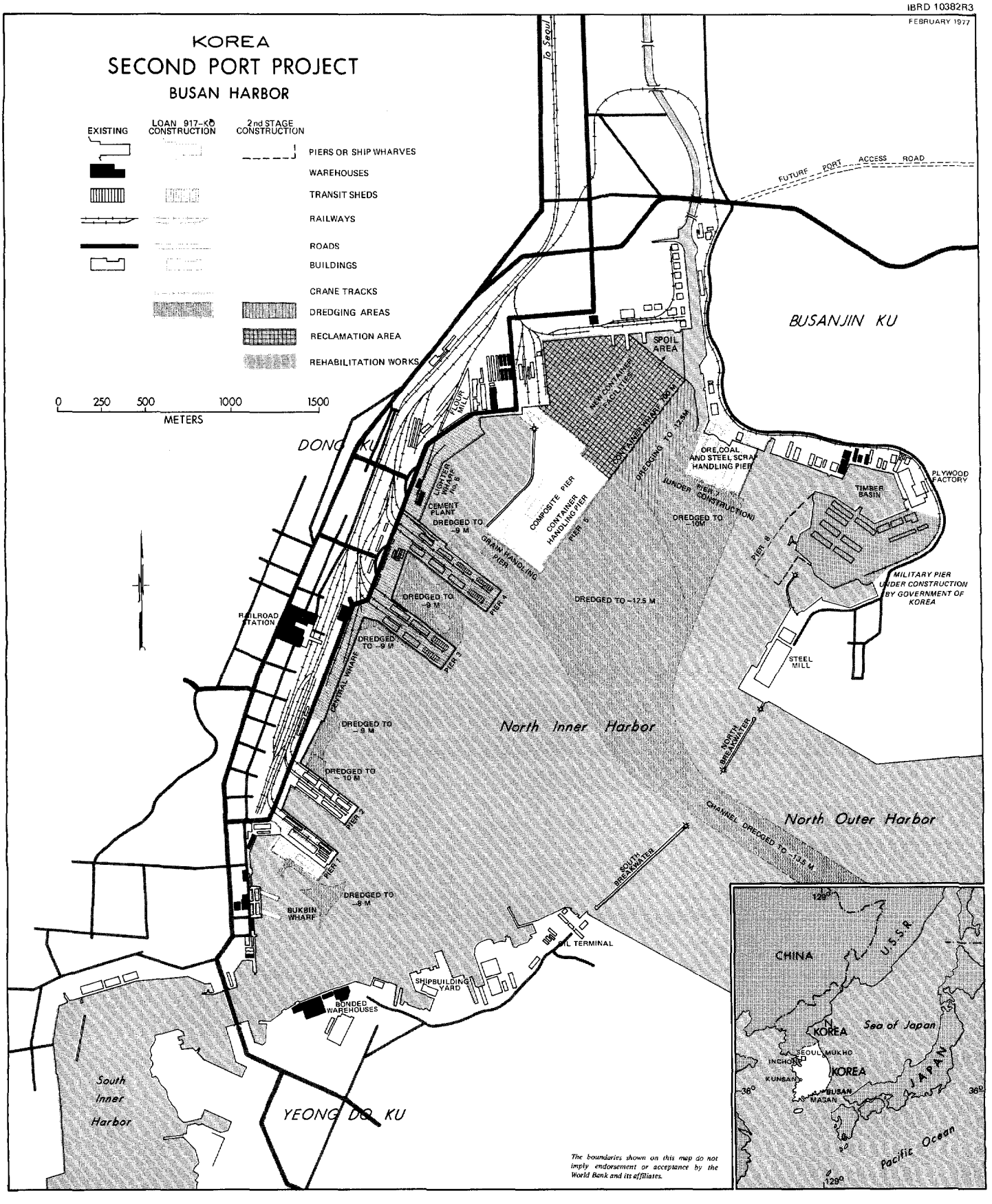


World Bank–16452

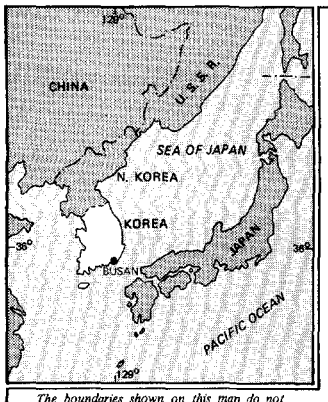

CHINA
U.S.S.R.
NORTH KOREA
Sea of Japan
REPUBLIC OF KOREA
JAPAN
Yellow Sea
Pacific Ocean
The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates.
NORTH KOREA
East Sea
Yellow Sea
KOREA
TRANSPORTATION NETWORK
EXISTING NATIONAL HIGHWAYS
EXPRESSWAY (FOUR LANE TOLL)
NATIONAL HIGHWAYS (PAVED)
NATIONAL HIGHWAYS (UNPAVED)
PROJECT HIGHWAYS
FEASIBILITY STUDY AND ENGINEERING (TECHNICAL ASSISTANCE CR 54- KO, FIRST PROJECT LOAN 769- KO, SECOND PROJECT LOAN 956- KO)
CONSTRUCTION AND IMPROVEMENT (FIRST PROJECT LOAN 769- KO, SECOND PROJECT LOAN 956- KO)
PAVING
CONSTRUCTION AND IMPROVEMENT (THIRD PROJECT)
PAVING
RAILWAYS
AIRPORTS (INTERNATIONAL)
PROVINCIAL CAPITALS
PORTS
INTERNATIONAL BOUNDARIES
0 20 40 60 80 100
KILOMETERS
Jeju
Seogwipo
Geojin
Cheolwon
Geumhwa
Sokcho
Whacheon
Yanggu
Inje
Weontong
Yangyang
Gwandaeri
Jumunjin
Chuncheon
Gyeongpodae
Gangneung
Munsan
Paju
Euijeongbu
Hongcheon
Donong
Yongduri
Hoengseong
Sogsari
Samwha
Mugho
Bugnyeong
Samcheog
Incheon
SEOUL
Yangpyeong
Yeoryong
Seongnam
Gwangju
Icheon
Yeoju
Weonju
Seamal
Jeongseon
Pyeongchang
Sinpohang
Hosan
Suwon
Singal
Osan
Jangheoweon
Jupo
Jecheon
Yeongweol
Baegsan
Hayeong
Maepo
Uljin
Pyeongtaek
Ansaong
Judeog
Chungju
Danyang
Hyeondong
Salmi
Punggi
Yeongju
Pyeonghae
Yangjin
Onyang
Cheonan
Taean
Hongsong
Yesan
Cheongju
Eunsaong
Yecheon
Jeomchon
Andong
Jinbo
Jochiweon
Gongju
Boeun
Sangju
Yeongdeog
Ganggue
Daecheon
Buyeo
Daejeon
Euiseong
Nonsan
Yeongdong
Euichang
Yeonmudae
Gimcheon
Gumi
Gasan
Pohang
Janghang
Geumsan
Muju
Yeoncheon
Gyeongju
Kampo
Ari
Jeonju
Daegu
Gimje
Janggye
Ulcheon
Hyeongpung
Gochang
Mycsan
Aneui
Eonyang
Ulsan
Gijigpyeong
Milyang
Opsan
Yeongsan
Beobseongpo
Namweon
Hwacheon
Damyang
Yeonwha
Yeonggwang
Masan
Jinju
Gimhae
Jinhae
BUSAN
Pochon
Swangju
Hwasun
Naju
Haggu
Hadong
Yeongsanpo
Suncheon
Samcheonpo
Jangseungpo
Beolgyo
Sacheon
Chungmu
Namhae
Mokpo
Boseong
Yeosu
Mido
Jangheung
Gangjin
Gaegog
Goheung
Haenam
Hoedong
Singeum
Wando
Jeju
Seogwipo
126°30'
33°30'
39°30'

IBRD 10382R3

FEBRUARY 1977



IBRD 12506
DECEMBER 1976



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TO SEOUL
SPOIL AREA
GATES
MAINTENANCE FACILITIES EXPANSION AREA
EMPTY CONTAINER STORAGE
STUFFING AND STRIPPING SHED EXPANSION AREA
EMPTY CONTAINER STORAGE
RAIL LOADING AREA
MAINTENANCE BUILDING
STUFFING AND STRIPPING SHED
TO SEOUL
GATES
CRANE RAILS
BERTHS 3,4 AND 5 EXTENSION (700 meters)
TRUCK AND AUTO PARKING AREAS
CONTAINER ON CHASSIS STORAGE
GATES
CONTAINER BLOCK STORAGE
CONTAINER ON CHASSIS STORAGE
CONTAINER BLOCK STORAGE
GRAIN SILO
GRAIN HANDLING PIER
CRANE RAILS
HANDLING PIER
CONTAINER
BERTHS 1 AND 2 UNDER CONSTRUCTION (FIRST PORT PROJECT)
NORTH INNER HARBOR

KOREA
SECOND PORT PROJECT
BUSAN HARBOR
CONTAINER PIER EXTENSION

PROPOSED
- CONTAINER PIER EXTENSION
- CONTAINER PIER CRANES
- RAILWAYS
- LIGHT TOWERS
- LIGHT POLES
- FENCE

UNDER LOAN 917-KO (FIRST PORT PROJECT)
- CONTAINER PIER CRANES
- RAILWAYS
- BUILDINGS
- FENCE
- INTERNATIONAL BOUNDARIES

0 50 100 150 200 250 300
KILOMETERS